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Wehrmacht Combat Helmets 1933–45

ian C Bell • Illustrated by Kevin Lyles

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Dedication

This project is dedicated to my wife Kristin Clontz Bell, for her love, patience and understanding of my passion for German helmets.

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WEHRMACHT COMBAT HELMETS 1933–45

INTRODUCTION

THE GERMAN STEEL HELMET (*Stahlhelm*) is one of the most notable of all pieces of 20th century military equipment, its distinctive appearance recognized throughout the world. Apart from Germany herself some 25 other countries have used the helmet, or one patterned after its characteristics. Produced from blueprints drafted with the assistance of the original designer of the M1916 'trench helmet', the updated World War II model was lighter and more compact than its World War I predecessors. At the time of its development the helmet reflected a state-of-the-art appearance at the forefront of military design; yet its shape still retained a faint echo of the medieval *salade* or *sallet*. This distant visual descendant of the headgear of 15th century German knights and footsoldiers would be used in all theatres of operations, from the North African desert to the steppes of central Russia.

A Reichswehr artilleryman wears the M1918 helmet with a hand-painted shield insignia in the white and green provincial colours (*Landesfarben*) of Saxony. The portrait was taken in Dresden between 14 March 1933 and 17 February 1934. The helmet is a large size 66cm shell with a standard 'carbine clip' chinstrap.

With an ever-increasing emphasis on mobile warfare, an improved design for the combat helmet was necessary to meet the needs of a mechanized army. Although designed primarily with the German Army (*Heer*) in mind, the helmet was quickly integrated into all branches of the armed forces (*Wehrmacht*). In the Navy (*Kriegsmarine*) the helmet found practical use among the many land-based units that supported sea operations – marine infantry, artillery and replacement and training troops, and particularly the crews of anti-aircraft (Flak) batteries and coastal artillery fortifications. Seamen serving aboard a variety of surface vessels also used the steel helmet.

The same helmet was issued to men of the German Air Force (*Luftwaffe*) for a variety of duties, ranging from basic training, sentry duty and ceremonial parades to front line combat. Apart from the very significant Luftwaffe anti-aircraft branch (whose heavy 8.8cm units doubled as anti-tank artillery on several fronts), the Air Force also provided a number of field formations for ground combat, the most celebrated being the 'Hermann Göring' armoured division.[1] From the outset, the helmet's basic design was intended to fulfil the whole range of requirements identified by a modern military organization; and a cut-down version of the standard helmet was even the origin for the design developed to meet the special needs of the growing parachute units (*Fallschirmjäger*).

1 See MAA 385, *The 'Hermann Göring' Division*, and MAA 229, *Luftwaffe Field Divisions 1941–45*

THE EARLY YEARS: 1919–33

When World War I ended in the Armistice of November 1918, Germany was thrust into a period of military and social chaos. This time of economic and political near-collapse saw many conflicts fought out in the streets of Germany's towns and cities. The Kaiser's soldiers who had fought the long and bitter trench battles of 1914–18 returned home – many of them convinced that they had not been defeated – to a country desperately in need of leadership, and offered it by a bewildering range of competing voices. Many of these men joined the Freikorps, a loosely structured movement of military veterans consisting of an estimated 300 separate groups, ranging from a few score men in local companies to divisional-sized formations which pursued mobile operations. Following trusted wartime leaders and retaining their equipment and weapons (including their helmets), they saw their role as defending their cities and regions against the threats of Communist uprisings, secessions, and foreign attempts to adjust some stretches of Germany's borders by force.[2]

On 6 March 1919 a force entitled the Provisional National Defence – *Vorläufige Reichswehr* – was formed by decree of the newly established Weimar Republic; the retention of the apparently contradictory title 'Reichs-' referred to its national status, embracing all the former kingdoms and *Lander* of Germany, rather than to the abdicated emperor. This force comprised both the Provisional National Army (*Vorläufige Reichsheer*) and Navy (*Vorläufige Reichsmarine*), in which nearly 400,000 Freikorps men would enlist.

On 28 June 1919, Germany was obliged to sign the Treaty of Versailles, which imposed conditions including the limitation of her army to no more than 100,000 men. The former ties with the Imperial army were formally abandoned on 30 September 1919, when the Vorläufige Reichswehr was again reorganized, becoming the Transitional Army (*Übergangsheer*). The Transitional Army and the Vorläufige Reichsmarine formed the basis of new armed services as outlined in the Treaty of Versailles; and on 1 January 1921 the two organizations became known as the Reichswehr and Reischsmarine respectively. The Reichswehr would continue to exist until 1935, when Adolf Hitler insituted the *Wehrmacht* – Armed Forces – which then incorporated the fledgling Luftwaffe as well.

During the early years of the Reichwehr, equipment that had been left over

This pre-war configured M1918 helmet was captured by a US serviceman in 1943 after a brief skirmish with German Army reserve forces in Italy. The helmet has a thick, hand-painted finish, both insignia decals, and an M1927 pattern liner. Hand-painted interior markings include the name of 'Major Babinge', the German officer killed in the firefight.

2 See Elite 76, *The German Freikorps 1918–23*

from World War I continued to be used. The Treaty of Versailles decreed that Germany must destroy or redistribute much of its military equipment, and approximately 64,000 World War I model helmets were destroyed under these terms of the treaty. The limitations on the production of military material were significant, greatly hampering the development and testing of new equipment. Bearing in mind the need to maintain an adequate military, in the mid- and late 1920s the German government authorized the remanufacture of a number of steel helmets utilizing the World War I patterns. These included variations that resembled the Model 1918 steel helmet (M1918), and the distinctive M1918 'ear cut-out' model, the latter popular with cavalry troops as well as specialized infantry units. These early transitional helmets were eventually phased out in favour of the newer Model 1935 helmet (M1935), introduced in large numbers in 1937.

Helmets of the Reichswehr

Reichswehr era troops serving in both the Reichsheer and Reichsmarine were issued Model 1916, Model 1917 and Model 1918 pattern helmets. These included a small number of wartime-manufactured M1918 'ear cut-outs', as well as remanufactured M1918 helmets in slightly larger sizes. The liner systems used in these helmets continued to be patterned after the three-pad type introduced with the M1917 helmet. Several modifications were made to the helmet liners, including the introduction of a newer model in the former World War I style (see 'Helmet Liner Systems' below). In an effort to standardize the overall look of the Reichswehr, most of the helmets were repainted using newer colours.

1934: The loader of an MG08 machine gun team wears the M1918 helmet with ear cut-outs – photos taken during field exercises confirm that a variety of helmets were worn during this early transition period. Of interest is the fact that the team leader (right) wears the early white breast eagle badge while the loader does not; such inconsistencies were common during 1934.

1936: A cavalry trooper of the 4.Reiter Regiment wears the M1918 helmet with ear cut-outs, bearing the national tricolour insignia in the position ordered on 17 February 1934.

These colours were much lighter in shade than those used during World War I, and did not include the angular three-coloured camouflage schemes ordered in July 1918. Beginning in 1923, Reichsheer helmets bore a distinctive hand-painted crest representing the province in which troops were garrisoned (see 'Helmet Insignia' below). In 1924 the Reichsmarine adopted a similar design, depicting a shield with crossed anchors. Many of the helmets formerly used by the Reichswehr were repainted in 1940 when shortages of military equipment required that older models be upgraded and reissued to the Wehrmacht.

The Model 1916 steel helmet

The very first steel head protection issued to Imperial Army soldiers was a local initiative by Army Group von Gaede on the Vosges front in 1915, with the aim of giving some overhead protection from artillery shrapnel and fragments. It was not a true helmet, but a partial bowl of thick steel (5–7mm) covering the top and front of the head, but not the back, and drawn down into a long nasal bar at the front centre. Mounted on a cloth-lined leather cap with rear strap adjustment, and weighing about 2kg (4.4lb), the 'Von Gaede' was manufactured by the army group's artillery workshops at Mulhouse. There is photographic evidence for its issue to line units, but only c.1,500 examples are thought to have been made.[3]

The M1916 helmet was first developed in 1915 by a process of experimental research under the direction of military physician Professor Friedrich Schwerd with Professor August Bier at the Technical Institute in Hanover. The design incorporated a protective dome with an overhanging brim that slanted down at the sides and back, giving the classic stepped 'coal scuttle' profile. The M1916 helmet shell was produced in six standard centimetre sizes (60, 62, 64, 66, 68, 70) from a 1mm thickness of hard martensitic silicon/nickel steel, by hot pressing in electrically heated dies. More costly and, at 1.2kg (c.2lb 10½oz), heavier than the French mild steel 'Adrian' helmet or the British 'Brodie' of hardened 'Hadfield steel', the German M1916 gave greater protection than either. Estimated production by the end of the war was more than 7 million examples.

Like the Allied models, the M1916 helmet was not designed to protect the head from bullet impacts but to deflect artillery fragments that fell on men in the trenches, which were causing some 80 per cent of head wounds. The elongated front brim or visor and the low-hanging neck shield protected the face and neck from injury (though paradoxically, the improved survival rates from such wounds greatly increased the number reaching the field dressing stations by late 1916).

3 Georges Bailly & Laurent Mirouze, 'Le Stahlhelm 1915–18 (1)', *Militaria No.31* (April 1988); see also MAA 407, *The German Army in World War I (2): 1915–17*

A noticeable feature of the M1916 were the raised 'horns' incorporating air vents on each side of the helmet, to disperse heat when the helmet was worn for prolonged periods. These 'horns' were designed to engage with the location cut-outs in an optional steel brow plate (*Stirnschilde*) that provided added protection from frontal bullet impacts; a strap on the brow plate also passed around the back of the helmet to hold it in place. These 5mm-thick brow plates were so heavy – 2–3.5kg (c.4½–7lb) – that they were practical only for the most static duties; and although several tens of thousands were made, they were very rarely seen in the trenches. The brow plates were not used by the post-war Reichswehr.

The steel helmet was secured to the head by means of a leather chinstrap that could be adjusted by two sliding buckles. The chinstrap attached to the inside of the helmet just above each ear; a triangular cut-out in a brass or steel '8'-ring on the end of the chinstrap fitted over a triangular extension on the face of a pierced round bolt riveted inside each side of the helmet. The liner consisted of a thick leather band held by three rivets, to which three thinner leather sections were sewn, each section with two pierced 'fingers'. Sewn to each section was a fabric bag holding a pad; adjustment was by a central drawstring passing through the holes pierced in the ends of each of the six fingers. Many M1916 helmets used by the Reichswehr had their liners replaced with a variety of upgraded systems. These included the M1931 helmet liner (M1931) that was subsequently used in all World War II combat helmets.

Two members (rear & right) of this machine gun team assigned to the 16.Infanterie Regiment wear the M1933 prototype helmet, identifiable by the sharply angled step in the lower edge; this is the initial pattern, with a longer frontal brim and no side slot. This helmet was unique in being made of 'Vulkanfiber', a composite plastic material similar to modern fibreglass. This photo was taken in 1934, apparently prior to the introduction of the *Heer* arm-of-service helmet decal, which displaced the national tricolour shield to the right side.

A company sergeant-major (Feldwebel) provides instruction on the proper use of the K98k rifle. The photo illustrates that double-decal M1935 helmets were used during field training and not merely on the parade ground. The proportions of the helmet indicate that the rifleman is probably wearing the smaller sized 62cm shell.

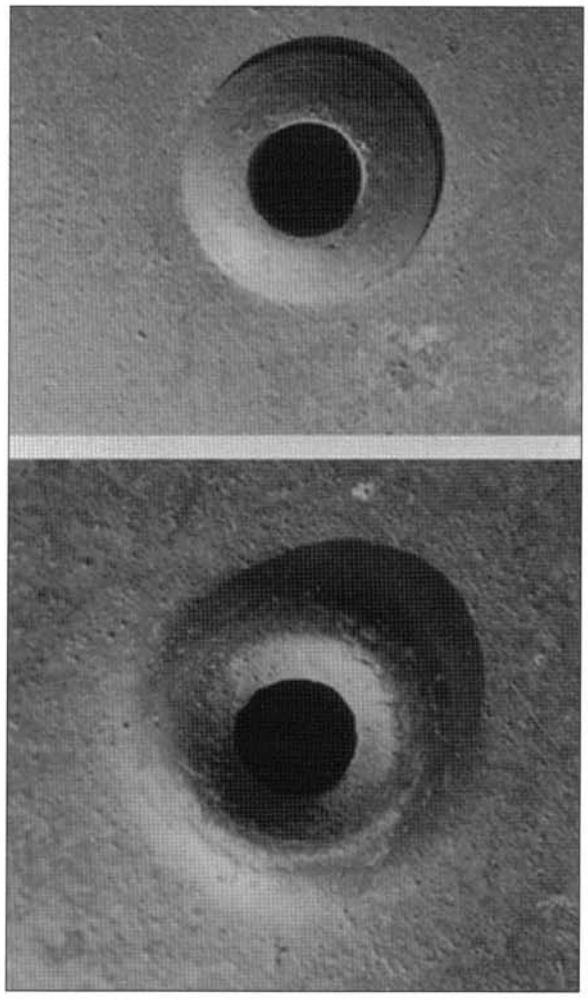
The Austro-Hungarian Army ordered nearly half a million M1916 helmets from Germany, and in November 1917 acquired licence manufacturing rights. The Austrian-made version (confusingly, designated M17 in Austro-Hungarian service) was produced in fewer centimetre shell sizes (62, 64, 66, 68), but was essentially no different in appearance from the German original. The Austrian version utilized 'D'-rings for attaching the chinstrap instead of the keyed bolts found on German helmets; these were riveted noticeably higher on both sides of the helmet than the German fitment. The two-piece Austrian chinstrap was produced in a khaki fabric with metal eyelets for the pronged buckle; and the liner incorporated a metal band to which the three two-fingered leather pad-mounting sections were attached. The Reichswehr converted a large number of Austrian helmets to German use, and many of these were pressed into service between 1934 and 1940.

The Model 1917 steel helmet

The M1917 helmet was a variation of the M1916 whose only difference was the design of the liner system (and some commentators decline to accept a separate 'M1917' designation). First introduced in the spring of 1917, the helmet incorporated a metal liner ring to replace the thick leather band that had previously held the three liner pads in place. During the Reichswehr period many M1916 helmets were upgraded by the addition of this metal liner band ring. Since both helmet shells were identical, interchanging the parts between them was simple. Like M1916

Serving on the Eastern Front, this Luftwaffe anti-aircraft Unteroffizier wears the standard M1935 helmet, with single 'second pattern' eagle decal applied to a smooth blue-grey factory finish.

An estimated one-third of all German helmets received an inspector's stamp on the inside of the dome. This was done as an independent process in order to ensure quality within an overall production batch. This ink stamp found in an M1935 helmet is dated 1939.



The air vents found on M1935 helmets differ from those on M1940 and M1942 models. The M1935 had a separately inserted hollow rivet (top); the other two models had an air hole punched directly through the steel shell with a raised, embossed rim (bottom).

helmets, the 1917 models used after World War I were often repainted in standard Reichswehr colours over their former Imperial Army paint schemes.

The Model 1918 steel helmet

There is no controversy over this classification. In 1918 the side chinstrap rivets of the M1916 were removed and replaced by internal 'D'-rings attached directly to the metal liner band ring. This change altered the exterior appearance of the helmet, and was identifiable by the absence of the external rivet low on each side. With the introduction of this modification an improved chinstrap was also manufactured. This incorporated a sprung hook or 'carbine clip' attached to one end, the other end being permanently mounted to the opposite 'D'-ring by a rivet. The carbine clip continued in use in both Reichswehr and Wehrmacht helmets during the transitional period when new equipment was being developed and old stock was still in use. Additional chinstraps with carbine clips were manufactured for general use prior to the introduction of the roller-buckle chinstraps of the mid- to late 1920s (see 'Helmet Chinstraps' below).

The M1918 'ear cut-out' helmet

The unique characteristics of the M1918 'ear cut-out' pattern are immediately obvious – an upward dip in the lower edges of the helmet shell just behind the level of the ventilation 'horns'. This model is often referred to as the 'cavalry', 'artillery' or 'telephone talker's' helmet because of its general appearance and its apparent popularity with men serving in these roles; but such terms have no validity. The helmet was developed and tested in August 1918 in response to requests by front-line troops for a helmet that allowed for better hearing in the trenches. An estimated 2,100 M1918 'ear cut-outs' are known to have been produced in medium sized 64cm shells by the established firm of Eisenhüttenwerke located at Thale. It was planned that a total of 100,000 were to be manufactured before the end of World War I; but the scarcity of surviving examples, and the extreme rarity of photographic evidence for its front-line use before the Armistice suggests that only small numbers ever reached the army.[4] The helmet proved successful, nevertheless, and had the Armistice not intervened this might have been the next pattern selected for general issue to front-line troops.

So popular was the M1918 'ear cut-out' that in the mid- to late 1920s at least one German firm was contracted to remanufacture the helmet in the larger 66cm shell size. This was intended to supplement the small

4 See forthcoming MAA 419, *The German Army in World War I (3): 1917–18*

number of World War I era shells in service, and to aid in expanding the range of head sizes available from a maximum of 57cm to a much larger 59cm. Like many transitional helmets, some were stored and later repainted with rough texture paint for reissue to Wehrmacht troops in 1940. These post-war helmets, too, are considered as rarities.

HELMETS OF THE WEHRMACHT

An estimated 25 million German helmets were produced between 1935 and May 1945. These were manufactured by a number of firms, including some which had gained experience through the production of helmets during World War I. In the early years the firm of Eisenhüttenwerke at Thale and the Sächsische Emaillier und Stanzerwerke at Lauter would lead the production efforts; other firms experienced in steel manufacturing and shaping would be added (see Table 1). In 1936 a helmet cost 6.00 Reichmarks; this price later fell to RM 2.80 as a result of design improvements and larger production volume. Helmet shells were manufactured in six different centimetre sizes (60, 62, 64, 66, 68, 70), of which each could accept one of only two differently sized liners. Approximately 80 per cent of all helmets were produced in the 64cm and 66cm shell sizes, with the oversized 70cm version being manufactured in very small numbers.

Each helmet was marked on the inside left rim with its shell size and abbreviated factory designation. On the inside rear rim appeared a numeric or alpha-numeric factory production code designating the lot in which the helmet had been produced. The Thale plant and the firm of Quist at Esslingen would later change their factory designations and placed their maker stamping in the rear of the helmet above the production code; these were denoted by 'ckl' and 'hkp' respectively.

Prior to the development of the M1935 helmet, German industrialists experimented with a unique composite material known as 'Vulkanfiber'. This lightweight material became the first substance used in early prototypes leading to the development of the M1935 helmet.

The Model 1933 Vulkanfiber helmet

On 18 March 1932 the Army High Command ordered the testing of a new prototype helmet that was intended to replace the older World War I models. This new helmet was entirely composed of a heavy plastic-type material known as Vulkanfiber. The Model 1933 Vulkanfiber helmet retained the basic shape of the standard helmet but was much lighter. The helmet was designed in two different styles, of which the first had a longer frontal brim, while the second had slide slots for hanging the chinstrap when not in use. The left side of the helmet allowed for the attachment of a metal shield bearing the Reichswehr provincial insignia of the wearer. Both models were placed into limited production following favourable field tests which concluded on 15 March 1933. Further testing was ordered on 4 May 1933, and small numbers were issued to a variety of Reichswehr infantry, artillery and

Table 1: Factory markings on helmet shells

Marking	*Firm*	*Location*
ET (*or* ckl)	Eisenhüttenwerke	Thale
FS (*or* EF)	Emaillierwerke AG	Fulda
NS	Vereinigte Deutsche Nikelwerke	Schwerte
Q	Quist	Esslingen
SE (*or* hkp)	Sächsische Emaillier u. Stanzwerke	Lauter

(Source: Baer, 1995)

Clearly visible in this portrait of an Eastern Front veteran is the M1942 helmet with flared rim. A dark patch on the left side shows where the Army service emblem was located before being scraped off in accordance with the directive of 28 August 1943.

communications troops. The helmet was removed from service and testing stopped following the successful introduction of the M1935 steel combat helmet. With the advent of the M1935, many of the remaining M1933 helmets were removed from military service and reissued to civilian organizations including fire brigades and city, rural, and railway police units.

The Model 1935 steel helmet

In 1934 testing began of an improved steel combat helmet whose design showed a development of the World War I models. Professor Schwerd once again played a role in creating the prototype; and Eisenhüttenwerke of Thale undertook preliminary testing and prototype design. The Supreme Command of the Army officially accepted the helmet on 25 June 1935. The M1935 was intended to replace all existing helmets in service.

The basic design was similar to the M1916, although it was more compact and lighter in weight. The helmet was press-formed in several stages using sheets of molybdenum steel.[5] Separately inserted hollow rivets replaced the large air vent lugs found on World War I helmets. The rim of the helmet continued to be rolled under for a smooth edge. The M1935 received the updated M1931 liner system as well as a newly designed chinstrap. The new chinstrap replaced the older carbine clip and roller-buckle styles found on earlier transitional helmets.

Beginning on 1 July 1935, requisitions for the M1935 were placed through the Procurement Office of the Army and Navy located in Berlin; this was the contracting authority that oversaw the acquisition and distribution of all military material for the Wehrmacht. The M1935 was the first helmet worn at the outbreak of World War II, and many were used until the very end of the war. Nearly 1.4 million M1935 helmets were manufactured in the first two years following its introduction; millions more were produced until 1940, when changes to the basic design were introduced and production methods changed. Despite modifications to the steel shell, German patent records indicate that subsequent versions of the helmet were still referred to by the original patent designation 'Stahlhelm 35'.

The Model 1940 steel helmet

Almost as soon as the M1935 helmet was put into production modifications to the basic design were underway. These were led by engineers employed by the Eisenhüttenwerke plant at Thale, which continued to be the foremost producer of helmets for the Wehrmacht.

5 Molybdenum is an alloying metal added during steel manufacture, which allows steel to be hardened by a slower quenching process without becoming brittle. Its use before 1918 was limited by its high price, and the fact that about 90 per cent of the world's sources of molybdenite were in the USA and South America.

Records indicate that on 29 October 1938 design engineer Erich Kisan of the Thale facility filed for a patent (No. 1458613, Group 72g, Class 2) that dealt with the elimination of the separate ventilation rivets. The proposal recommended that the air vents be embossed into the sides of the helmet shell instead of being separately inserted; this was partly to save material, and partly due to the belief that the rivet could become a projectile if the helmet were damaged in combat.

Interestingly enough, this modification would not be approved by the Army High Command until 26 March 1940. At that time orders were given for the modification of the M1935 into what has been designated the M1940 pattern helmet. The M1940 was produced using an improved manganese-silicon steel. The helmet was also fitted with an improved liner band ring (see 'Helmet Liner Systems' below) that proved more durable and less costly than the aluminium version. Other than these changes, the M1940 remained identical to the M1935. Manufacturing facilities and equipment had to be upgraded in order to produce the M1940, which resulted in a slightly heavier helmet with a more rounded shape as compared to the M1935. Slowly the M1940 helmet began to replace the M1935 in front-line use, although both were seen in parallel until the end of the war. Stockpiled liner parts and rivets intended for the M1935 were often incorporated into the M1940 until depleted or superseded by updated supplies.

The Model 1942 steel helmet

The last wartime upgrade to the standard helmet was ordered on 6 July 1942 as part of an overall restructuring of Germany's wartime industrial programmes. At the request of the Army High Command, the rolled edge found on M1935 and M1940 helmets was discontinued as an economy measure. On 1 August 1942 the first M1942 helmets were placed into production. By this time, the standard helmet was now made in four basic steps by hot-stamping steel into the desired shape; the older process of press-forming the shell, in combination with

The flared-rim M1942 helmet was ordered into production on 6 July 1942 in order to streamline the production process and lower costs. Helmets produced after 28 August 1943 bore no factory-applied insignia.

oven-heated tempering, had now been replaced by a faster and more efficient method. Many M1942 helmets bear the signs of rapid hot-stamping, as demonstrated by rippled stress marks in areas where the steel is shaped to form rounded corners. The M1942 was mass-produced until late 1944 and early 1945, when most facilities were overrun by Allied armies, or simply left idle by the lack of sufficient materials for continued production.

THE FALLSCHIRMJÄGER HELMET

On 29 January 1936 the commander-in-chief of the German Air Force, Reichsmarschall Hermann Göring, established Germany's first paratroop training school at the Luftwaffe base at Stendal. Trainees consisted of volunteers from the Regiment 'Hermann Göring', which had evolved from a paramilitary police unit in 1933 before being incorporated into the Luftwaffe. The men were reorganized into the I.Bataillon and 15.(Pioneer) Kompanie of what was to become Fallschirmjäger Regiment 1. Likewise, on 1 April 1937, the Army formed a parachute company which also trained at Stendal.[6] At this early date, when jumping from an aircraft was considered more of an athletic stunt than a serious military task, no suitable equipment existed for parachute training. Consequently a new protective helmet was designed for this purpose by Eisenhüttenwerke; with the appearance of a cut-down standard M1935 helmet, it was soon introduced for general use in 1936.

This photo illustrates the paratroop helmet in its early smooth, light field-grey finish with double insignia decals. The Fallschirmjäger wears the second pattern jump smock in olive green, with the parade version of the parachute harness straps. He is a recipient of both the DRL Sports Badge and the Hitler Youth Sports Leader Award, worn below his parachute qualification badge.

The Model 1936 paratroop helmet

The Model 1936 paratroop helmet was made of steel, the domed skull being of the general shape of the M1935 helmet but without the extended frontal brim and flared side and rear. It employed a three-rivet M1931 liner retaining system like the M1935, but with a modified eight-'finger' leather liner and a heavy foam pad in the crown. The helmet used the same hollow rivets as the M1935 for air vents. The unique chinstrap system had two 'Y'-shaped elements, designed to cross behind the back of the neck and unite below the ears before passing under the chin. A carbine hook secured each of the four strap ends to 'D'-rings on the helmet's liner ring. The straps were then made tight around the chin by pronged roller-buckles. Four reinforced oblong slots above the edges of the helmet shell allowed the wearer to engage the carbine hooks when it was not used for parachute jumping.

The Model 1937 paratroop helmet

In 1937 an improved helmet shell was introduced that utilized the same components as the M1936.

6 See MAA 139, *German Airborne Troops 1939–45*

The M1937 was nearly identical to the M1936 with the exception that it now had two, rather than four, non-reinforced oblong slots in the helmet shell. In sustained use the liner system proved faulty, as the three split rivets combined with the aluminium M1931 liner band ring tended to warp or shear. Subsequently the helmet underwent modifications that resulted in the introduction of the improved M1938 paratroop helmet. Following the introduction of the latter many of the prototype M1937 helmet shells were stored; and a few of these were eventually reissued with new liners, chinstraps and paint finish to meet general shortages during the later war years.

This 1941 studio portrait of a young Fallschirmjäger illustrates the M1938 paratroop helmet with single decal. Note the unique chinstrap arrangement, held by snaps and a friction clip.

The Model 1938 paratroop helmet

Following the experience gained from field trials of the M1937 helmet, designers soon modified the shell, liner system and chinstrap in order to ensure a more stable and protective jump helmet. To better secure the liner, the M1938 incorporated four hollow-bore spanner bolts (with screws and hexagonal washers) in place of the three split-tailed rivets found on the M1937. The first of these spanner bolts were made of zinc-plated brass and were attached by a single hexagonal washer. This was changed on 16 June 1938 by the introduction of steel bolts with two steel hexagonal lock washers, between which sat the ends of the chinstrap, the two rear ends being secured by a single central bolt.

The liner system was completely redesigned, with heavy rubber padding on the sides and crown and an improved aluminium liner band ring; later production models incorporated a zinc-plated steel ring instead of aluminium. Helmet sizing was achieved by varying the thickness of the rubber padding in the appropriate sized helmet shell. The support lining was now constructed out of two pieces of leather sewn together in the centre, in which 12 holes were cut for ventilation. Sheepskin leather was initially used for the liner, but was supplemented by the addition of pigskin from 19 March 1940. The sponge-like padding in the earliest helmets was crafted out of natural orange rubber; this was later changed to synthetic rubber with a black or dark grey colour.

The chinstrap was modified by the removal of the carbine clips in favour of a sliding buckle that could lock under the chin when the two ends met. The chinstrap also incorporated a quick-release tab so that the tension could be loosened and the helmet removed quickly. The oblong side slots in the shell edges formerly provided for the carbine clips were no longer needed, and were omitted. Several different types of buckles were used on the chinstrap, all of which served the same basic purpose. The most common was a friction clip arrangement, followed by a gripper clip, gripper buckle, or pronged buckle arrangement. The gripper clip types used a fine serrated edge that held the leather strap in place against a bar.

The M1938 helmet was constructed in four different centimetre shell sizes (64, 66, 68, 71), in which four holes were struck to attach the lining using the spanner-bolt configuration described above. Eisenhüttenwerke undertook the design and production of these helmets, and was the sole manufacturer throughout the war. Original examples are stamped with 'ET' or 'ckl', representing both trademarks used by the Thale manufacturing facility. No other revisions to the basic design were introduced since the M1938 proved satisfactory for its intended purpose. However, there continued to be persistent problems with attaching the liner to the shell.

The spanner bolts underwent several design revisions during the war in efforts to resolve this problem. The original spanner bolt required the use of a specialized two-pronged tool for adjustment, which led to difficulties under field conditions. As a result the overall design was changed some time in 1942. This new design introduced a hollow-bore style with a standard slot, that was easily removed or tightened by a regular screwdriver. By 1943 the bolts were once again changed for the sake of economy, and were now manufactured without the central air vent. Both of the improved retaining bolts were produced from aluminium, which was later changed to steel for increased durability.

The M1938 paratroop helmet with textured slate-grey finish. Just visible is one of the hollow spanner bolts to retain the liner to the shell and to provide some ventilation; the central air vent is flanked by two small holes for the adjustment tool.

Interestingly, many Fallschirmjäger veterans have commented on their general dislike of the overall paratroop helmet design. While the chinstrap arrangement was well liked because of its ability to hold the helmet completely secure, many veterans have complained that the helmet was not properly ventilated and became very hot in warm climates. In addition, there was a general feeling that the lack of a flared brim gave little protection against artillery fragments and direct fire from all sides. Veterans of Fallschirmjäger units have often expressed the view that the standard M1935 pattern helmet would have sufficed, and would not in practice have presented a serious risk by getting caught up in the shroud lines when jumping from aircraft. Many have also recalled that the retaining bolts were in need of constant adjustment, since the screws would become loose from their retaining washers during heavy use. If the bolts were lost, ad hoc adjustments were made in an attempt to keep the liner inside the helmet shell; the most common was wire inserted through the empty bolt hole and then wrapped around the liner band ring and helmet shell. In other cases, two-pronged rivets of the type used on standard M1935 helmets were inserted through the bolt holes.

HELMET LINER SYSTEMS

At the outset, helmets used by the Reichswehr were configured with standard World War I-type three-pad leather liners like those found in M1917 helmets. These consisted of a single metal liner band ring, with perforations around the sides to which three leather pad-mounting sections were sewn. The latter were constructed to allow a thin 'pillow' of horsehair to be inserted into a small pocket on the underside which was secured by a tie string. Rarely were the pads ever actually sewn to the liner, as the existing configuration proved secure enough. A white cotton or brown leather drawstring was used to pull each of the six leather 'fingers' of the three pad-mounting sections together to adjust for sizing.

Early liner improvements

During the 1920s the older wartime pads were often removed and replaced with similar looking mounting sections with 'pillows' permanently sewn to the undersides. These upgraded liners also included a thicker woven tie string, and the ends of the fingers were reinforced with a metal grommet (eyelet). About the same time a similar liner system was introduced that incorporated six separately sewn fingers attached to a single longer strip of leather in place of the three separate sections. Onto the strip of leather was sewn a wool band, to which anywhere from six to eight metal hooks were hand-stitched. The entire lining was then hooked onto a thick cardboard ring inside the helmet. In some cases the material used for the lining portion was nothing more than painted canvas. Many of these liners also saw service in civilian-style police and fireman's helmets. The introduction of these inexpensive alternatives was due to the impoverished state of the Germany economy.

OPPOSITE, BELOW **The factories that produced the metal bands for the M1931 liner marked each side with a trademark and a size designation. One of the first to produce the liner was the firm of Max Densow/Berlin Kofferfabrik, whose marking appears here in a 1936-dated example of the aluminium liner band. This firm discontinued production of helmet components before the outbreak of war.**

The Model 1927 liner

In 1927 an upgraded lining system was designed as the standard replacement for aging or worn-out leather. Officially designated the M1927, this consisted of a thick leather band to which three leather liner sections with permanently sewn pads were attached, each section having two fingers. To the sides of the leather band were riveted 'D'-rings through which a chinstrap could be inserted. In many cases M1927 liners incorporated a permanently attached chinstrap, its ends being riveted to the outer sides of the band and fastened with pronged roller-buckles that allowed for adjustment under the chin. The M1927 liner was used in a number of early transitional helmets, including the M1918 helmet and its predecessors. A small number of helmets with M1927 liners were used until 1943 by reserve and training units.

BELOW **Some early liners had a maker's trademark stamped directly into the leather. This oval mark identifies the firm of Schuberth-Werke AG in Braunschweig. The markings indicate the year (1937) and the size (64cm) of the helmet shell. Markings such as these are often found only on pre-war dated helmets.**

The Model 1931 liner

On 14 November 1934 the Army introduced an improved liner system that was intended to replace the M1927 type and all other systems in

Table 2: M1931 liner manufacturers

Firm	*Location*	*RB Number*
Beidermann u. Czarnikow[1]	Berlin	0/0256/0038
Beidermann u. Czarnikow[2]	Litzmannstadt	0/1035/0293
Berlin Kofferfabrik INH Max Densow[3]	Berlin	–
F.W.Müller Jr[4]	Berlin	0/0250/0322
Karl Heisler[5]	Berlin	0/0250/0201
Metall-Lederverarbeitung Werner Zahn[6]	Berlin-Charlottenburg	0/0251/0111
Schuberth-Werke GmbH[7]	Braunschweig	0/0471/0048

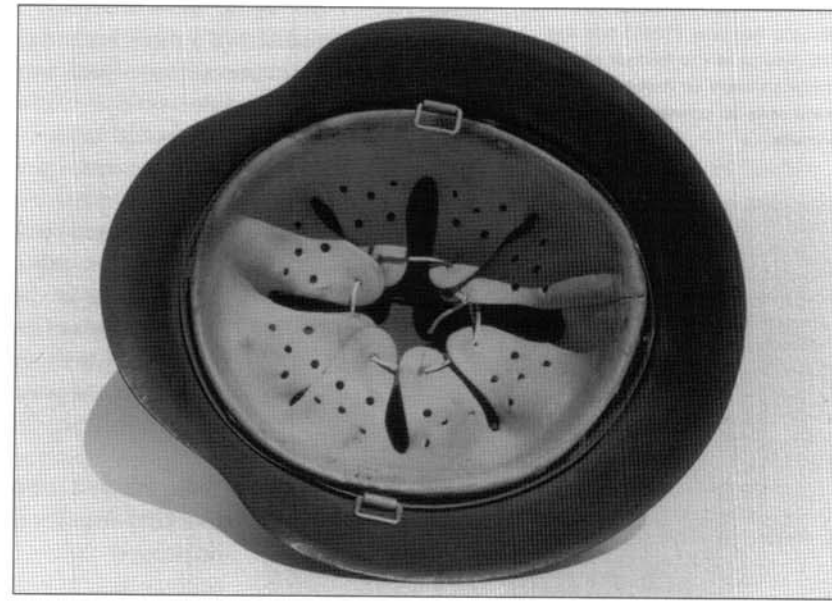
Notes:
1 Marked 'B&C Berlin' prior to the RBNr
2 Marked 'B&C Litzmannstadt' prior to the RBNr
3 Discontinued production 1938
4 Also manufactured paratroop helmet liners
5 Manufactured only paratroop helmet liners
6 Produced aluminium liner bands until 1943
7 First marked 'A-G', then 'GmbH', and changed to 'K.-G.' beginning 1938

(Source: Author's research)

use. Official acceptance of this new liner coincided with the prototype testing of the M1935 helmet. Designed and patented in 1929 by Schuberth-Werke of Braunschweig, the M1931 liner was produced in small numbers for the German Army, who tested and endorsed the system before 1934. Several makers were contracted to produce the liner beginning in 1937 (see Table 2), when large-scale production of the M1935 helmet began. Between 1931 and 1934 the aluminium liner band was marked '1931' to denote the year of patent approval; from 1935 onwards the marking was changed to denote the actual year of manufacture. Despite two minor changes in basic design, the M1931 liner was used on all combat helmets until May 1945.

The M1931 liner differed greatly from its predecessors and was quite complex by comparison. The new system took into account the proportions of a man's head in relation to the actual size of the helmet shell. When a soldier was issued a helmet, the size of his head would determine not only the size of the liner, but also the size of the shell. The liner was constructed in such a way that it allowed for two alternative head sizes for each of the six sizes of helmet shells. Each liner band ring was marked with a number denoting metric size. The outermost ring was stamped with both shell and liner size in combination with the letters 'n.A' (Neues Art – 'new style'). While allowing a comfortable fit, this design offered virtually no interchangeability of liner parts from one helmet to another.

The M1931 liner was constructed using two interlocking metal bands with one situated inside the other. Into the outer band were stamped holes through which three retaining rivets were inserted to attach the



In the spring of 1940 aluminium liner bands were slowly phased out in favour of zinc-galvanized steel. Leather was attached to the inside ring of the double liner band, as seen on this Luftwaffe M1942 helmet. Veterans generally consider the helmet liner to have been comfortable; the leather configuration and air vents allowed enough air flow to keep the head from becoming overheated.

liner to the helmet shell. Riveted to the outer band were two pivoting 'D'-ring mounts for the attachment of the leather chinstrap. The inner band was secured to the outer band by five steel leaf springs mounted by means of a small rivet. The outer bands were manufactured in standard sizes to allow for their insertion into one of the six different shells. The inner bands and their leaf springs were manufactured in variable sizes of which only two could be inserted into one of the appropriate sized outer bands. Inner bands ranged from 52cm to 63cm, based on the size of the helmet shell (see Table 3). The inner band was selected to match the head size of the wearer. The resulting system was adjustable in two different centimetre equivalents per helmet, from very small (52cm in a 60cm shell) to very large (63cm in a 70cm shell).

The earliest of the M1931 liners were manufactured from aluminium with an eight- or nine-fingered leather lining cut from either goat- or pigskin. The leather portions were manufactured by several independent firms (see Table 4) and supplied to the makers of the liner bands for assembly. The leather portion was perforated to allow heat to rise from the top of the head; the air vents in the sides of the shell were intended to help disperse the heat. Ink stamps on one of the rear fingers of the liner indicated size. A woven drawstring passed through each of the leather fingers to allow for proper adjustment. The leather portion was attached to the inner ring of the liner band by 12 to 13 flat-headed aluminium rivets (these were later produced from zinc).

The first modification to the M1931 liner came on 20 January 1938, when the firm of Werner Zahn in Berlin filed a patent for modifying the original design. Following the introduction of the M1935 helmet, both the Army and Luftwaffe had filed complaints regarding the outer band's tendency to bend or warp when the helmet was hung from its chinstrap. The design change introduced an aluminium reinforcing plate that was riveted to the sides of the outer band. All of the manufacturers made this revision in 1938 when large-scale production began. The only firm to discontinue making the M1931 liner system was Max Densow/Berlin Kofferfabrik, one of the original producers.

In 1940 the second design change to the M1931 liner saw firms beginning to produce liner band rings from zinc-plated steel. The

Table 3: Liner and shell sizes

Liner size	*Shell size*	*Fit*
52–53cm	60cm	Very small
54–55cm	62cm	Small
56–57cm	64cm	Medium
58–59cm	66cm	Large
60–61cm	68cm	Extra large
62–63cm	70cm	Custom

(Source: Author's research)

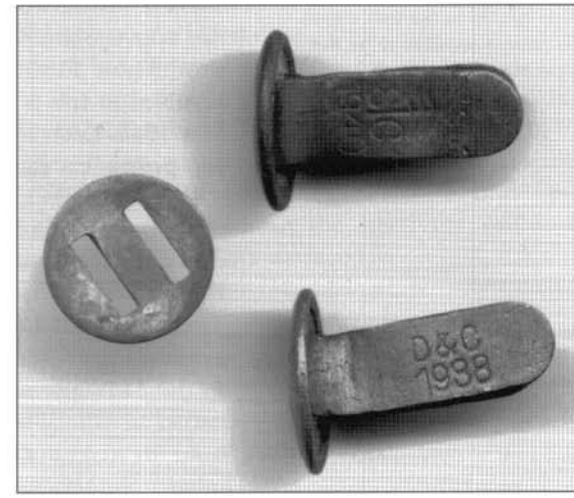
Helmet rivets were generally marked with a maker's name and date, though some early examples were never marked. The brass rivet at top was manufactured by Schmöle u. Company and bears its 'pinetree arrow' between 'S' and 'C', above '1940'. The rivet at bottom was made by Dransfeld u. Company and is marked 'D&C' above '1938'. All rivets used the standard size washer shown at left.

Table 4: Leather liner manufacturers

Firm	*Location*
Albert Bolz	Rudolstadt
Fr.Pfaff	Idstein/Taunus
F.L.Bailleul	Berlin
F.W.Müller Jr[1]	Berlin
Karl Heisler[2]	Berlin
Karl Nordmann	Rudolstadt
Lederfabrik u. Co Heinrich Berniger	Idstein/Taunus
Schuberth-Werke[3]	Braunschweig
Textil u. Lederverarbeitungswerke	Litzmannstadt

Notes:
1 Maker of paratroop liners and metal bands; RBNr 0/0250/0322
2 Maker of paratroop liners and metal bands; RBNr 0/0250/0201
3 Maker of both standard and paratroop liners; RBNr 0/0471/0048

(Source: Baer, 1995)



The M1935 steel helmet as worn by a German infantry private (Schütze). The original smooth field-green paint finish is evident. The chinstrap buckle is positioned on the right side of the helmet, as prescribed for men who were left-handed; this was to prevent the buckle from catching on the rifle breech when operating the bolt action. The helmet appears to be the larger sized 68cm shell.

chinstrap 'D'-ring attachments were also changed to incorporate round rather than square corners. The new zinc liners were more durable, and thus eliminated the need for reinforcing side plates. During the transition from aluminium to zinc some firms continued to use older components in the overall assembly process, thus creating hybrids of the two liner systems; notable are zinc liners with aluminium 'D'-rings, as well as aluminium liners with the later 'D'-rings. Many firms continued to produce the aluminium version until 1940; and Werner Zahn of Berlin-Charlottenburg manufactured the early-style aluminium liners until 1943. As a result, some of the first M1940 helmets assembled during 1940 and 1941 featured the early aluminium liner bands.

Liner retaining rivets

The M1931 liner was secured to the shell with three retaining rivets (*Splinte*), two being located above the temples and one centrally at the back. The rivets featured a round, semi-domed head, with two prongs that were secured by a flat washer. The rivet's prongs were inserted through a pre-drilled hole in the helmet shell, and passed through the outermost band of the helmet liner. The flat washer used to secure the rivet to the helmet contained two rectangular slots. Once the rivet was inserted through the band the two prongs were drawn back and flattened.

Initial specifications called for the rivets to be made in four separate parts: the domed head, a solid metal base to which the head was crimped, the prongs, and finally the retaining washer. The entire rivet was manufactured of brass and then zinc-coated by galvanization, to prevent the green corrosion that typically collects when brass is exposed to moisture. Six firms were contracted to manufacture the rivets (see Table 5); these were responsible for producing the rivets, painting them the appropriate colours, and packaging them for shipment to helmet production facilities. These six firms were the only manufacturers involved in the production of liner retaining rivets right through until May 1945. Each firm was required to place a maker mark on one of the two prongs on each rivet. This practice was not fully adhered to during early production; helmets with components dated 1937 and earlier often have unmarked rivets.

Rivet modifications

The first M1935 helmets assembled received brass rivets with zinc coatings as previously described. The majority of these helmets were shipped first to the Luftwaffe and then to the Army. On 14 May 1936 the Luftwaffe issued an official bulletin citing the brass retaining rivets as insufficient to hold the weight of the helmet when hung by the chinstrap or under severe impact; the apparent softness of the brass sheeting resulted in the shearing

Table 5: Helmet rivet manufacturers

Firm	*Location*	*Typical mark/year*
Beidermann u. Czarnikow	Berlin SO 36, Elsenstrasse 106	B.u.C.38
Dransfeld u. Company	Menden, Krs.Iserlohn/Westfalia	D&C 1939
Fr.Wilke	Westig/Westfalia	FWW 40
Julius Kremp	Lüdenscheid/Westfalia	IKA 41
Mathias Salcher u. Söhne	Wagstadt/Sudetenland	MSS 44
Schmöle u. Company	Menden, Krs.Iserlohn/Westfalia	SC 1942 (+'pinetree arrow' mark)

(Source: Author's research)

of the rivet prongs. Consequently, the manufacturers involved delivered a new supply of rivets to the Luftwaffe. One can only assume that other branches of the Wehrmacht encountered the same problem. The Luftwaffe received the majority of helmets from the Thale plant in the early part of 1936. The Army received its first large delivery on 30 April of the same year, just a month after the Luftwaffe had noted the shearing problem. Bearing this in mind, it seems likely that the Luftwaffe bore the initial brunt of actual design flaws. Addressing the shearing problem may have helped to correct the lack of consistency in manufacturers' marks on the rivets, mentioned above. This may be one reason why helmets dated 1937 and later often have marked and dated rivets as originally called for in June 1935.

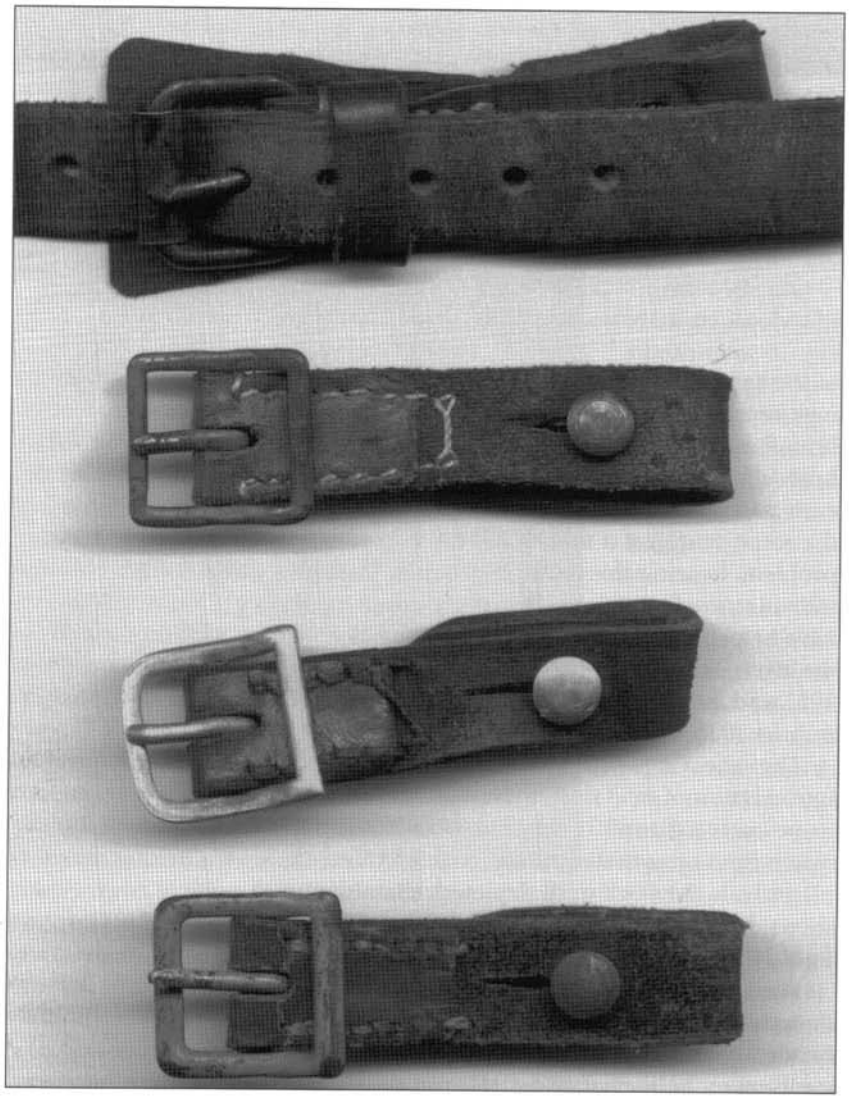
The shearing problem was eventually corrected by the gradual introduction of steel rivets galvanized with zinc. The steel rivets continued to be manufactured in four parts with a solid metal head. Despite the switch from brass to steel, many firms continued to supply helmet assembly plants with old stock until depleted; examination of original rivets clearly shows that at least three firms made brass rivets until 1939, and at least one until 1940.

Further changes to the liner retaining rivets took place as the demand for steel increased. Some firms made the transition to hollow-headed rivets made in only three parts, to simplify manufacture and save steel; many helmets dated 1941 and later exhibit hollow-headed rivets. Generally these were as durable as the solid type, although wartime examples with extensive combat wear often show slight indentations to the domed head. In many cases paint did not adhere well to the rivets; period photographs and original helmets alike often show bright metal rivet heads where the paint has chipped off.

One final production change came in 1944 when the firm of Mathias Salcher u. Söhne produced hollow-headed aluminium rivets bearing the maker's name and date; these required no galvanization. Wartime documents indicate that sufficient quantities of rivets had been manufactured by the close of 1944 without the need for additional production; as yet no rivets dated 1945 have surfaced.

HELMET CHINSTRAPS

The development of an improved liner system resulted in the need for a better chinstrap, and improvements began in the late 1920s following the introduction of the M1927 liner. Early chinstraps were cut from



A number of firms produced chinstraps, which resulted in a variety of buckle styles. These included the roller-buckle chinstrap (top) as well as standard types that employed painted (top & bottom) and unpainted (middle) buckles.

brown leather and were sometimes attached to the sides of the liner band with black rivets. These two-piece chinstraps employed a pronged roller-buckle, which was typically painted black to prevent corrosion. The long end of the chinstrap was secured by a leather loop on the buckle end.

After the introduction of the M1931 liner the roller-buckle chinstrap continued to be manufactured with only slight modification. It was now secured to either side of the newly introduced metal liner band by 'D'-rings. In June 1935 testing of the M1935 helmet was concluded, resulting in a requirement for a chinstrap more suited to the new helmet than the roller-buckle type.

Design specifics

The M1931 liner system called for a two-piece chinstrap made of leather. One side was left natural and the other dyed a dark brown or black; straps made under separate contract for the Luftwaffe were often manufactured entirely from brown leather. A single-pronged buckle made of sand-polished aluminium was secured to the shorter end of the strap by two rows of stitches with an average of eight stitches per row. At the end was a pear-shaped insertion point stamped into the leather, through which a double-ended, sand-polished aluminium stud was inserted; the stud was circular with a slightly domed head, and allowed the end of the strap to 'button' tightly together after passing through the 'D'-ring on the M1931 liner band. The long end of the strap was punched with a row of 13 holes for the buckle prong, allowing a wide range of adjustment; it too was secured through a liner band 'D'-ring by an aluminium retaining stud.

Chinstraps manufactured from 1935 to approximately 1940 used aluminium for all metal parts; later examples were made with steel buckles and studs. These were generally left bare, but were sometimes painted a medium grey or field-grey colour depending on the maker – buckles and studs were manufactured under separate contract and supplied to leather makers.

Table 6A: Chinstrap manufacturers (partial listing)

Firm	*Location*
Carl Hepting u. Co[1]	Stuttgart-Feuerbach
C.Korn	Alzey
Gebruder Klingen	Dresden
G.Singer	Klattau
G.Schiele	Loburg
Josto	Prague
Lagesa	Dresden
Lüttringhaus u. Co	Köln-Mülheim
Nordmark[2]	Rudolstadt
Paul Klopfer	Berlin
Rahm u. Kampmann	Wuppertal
R.Larsen	Berlin

Notes:
1 Later designated by RBNr 0/0750/0100
2 Probably the firm of Karl Nordmann, also a producer of leather liners

(Source: Author's research)

Table 6B: Known RB Numbers as marked on chinstraps

RBNr 0/1151/0005
RBNr 0/0494/0008
RBNr 0/0390/0202

0/0750/0100
0/0384/0011
0/0365/0012
0/0380/0121
0/0494/0008
0/0552/0002

(Source: Author's research)

Manufacturers and markings

Beginning in June 1935, the first contracts for chinstraps were granted to four different firms within Greater Germany. Strict quality standards were required of firms hoping to retain military contracts, and many chinstraps produced by different firms appear quite similar. While the first contracts did not require makers to mark their product, the potential need to trace back any faulty workmanship resulted in a 1937 requirement for all firms to do so. Chinstrap makers had to stamp the inside of the long end with their company trade name and date (the latter also helped military supply clerks in determining the wear-out date of a given article). As wartime needs grew, many more leather makers were contracted to produce chinstraps (see Table 6A), some of them located in German-occupied countries such as France and Czechoslovakia. Chinstraps were delivered to military supply depots as well as to helmet manufacturing firms. In some cases helmets were delivered directly to military depots without chinstraps attached, and the supply staff were responsible for the correct fitting of straps to helmets.

Beginning in 1942, manufacturers were required to adopt an eight-digit national business number (*Reichs Betriebs Nummer* – often abbreviated *'RBNr.'*). This code number – intended to mask company trademarks from Allied intelligence – replaced manufacturing marks on all forms of military clothing and equipment until May 1945 (e.g. see Table 6B). Many Luftwaffe chinstraps were also marked with a military supply office (*Luftwaffe Bekleidungs Amt – L.B.A.*) stamp for tracking purposes. This mark was generally impressed into leather articles by both stamp and ink; on chinstraps it was placed centrally on the inside of the long end of the strap. In the early years a letter designating the location of the supply office that approved the requisition and the year of issue often followed the mark. For example, the Luftwaffe office in Stuttgart marked equipment with *L.B.A.S.*, and that in Berlin with *L.B.A.B.*; in most cases these markings were discontinued from standard application after 1940.

Chinstrap variations

Soldiers in combat had unreliable access to new or replacement articles of any kind, and consequently many field modifications to the standard chinstrap were made. These include unique variations made of canvas webbing or non-standard leather. Many chinstraps had their buckles re-sewn if damaged. Period photographs show early roller-buckle chinstraps being worn well after 1940. It was also common for men to cut the long end of the chinstrap shorter; veterans report that the long end would sometimes become an annoyance due to its tendency to ride close to the ear and chafe the sides of the head.

Kriegsmarine helmets in particular were frequently equipped with field-made chinstraps. These followed the basic design of either the roller-buckle or standard straps, but often had smaller, non-military

buckles and hand-crafted components. While the reason for this is unknown, one theory explains it by the fact that the Navy required fewer helmets than the other services. At its peak the Kriegsmarine had an estimated 800,000 men, compared to nearly eight times that number in the Army. As a result, Kriegsmarine stores may have found themselves short of replacement chinstraps; and under such conditions it was not uncommon for supply units to manufacture parts and components to fill the gap. Veterans confirm that it was the duty of the supply staff to make repairs or modifications to helmets damaged in combat; one can assume that many helmets with period but non-standard manufactured chinstraps fall into this category.

PAINT FINISH

The type of paint used on German helmets varied greatly in colour and texture. Many collectors have noted that no two German helmets ever appear to have exactly the same paint finish. The evolution in paint finish even over a relatively short period, and the ability to standardize colour, were complicated by several factors. Like other features, the paint used on helmets was modified as a result of practical experience of simulated combat manoeuvres and field situations. Many helmets underwent factory or supply depot refurbishment prior to reissue, and received different paint schemes. When paint was available in the field

This photo taken in 1935 shows the M1918 helmet worn with 1934 Army insignia. In the pre-war years helmets like this were typically repainted light field-grey in a matt finish.

Large numbers of M1918 helmets were refurbished with rough-textured paint and the single decal, and many of these were issued to German infantry prior to the 1940 invasion of France. German veterans of that campaign have commented that it was not uncommon to see the older helmets in use even with front-line combat units.

OPPOSITE **The dangerously reflective smooth factory finish of early helmets – particularly when the paint was buffed from sustained use – is clearly visible here. Many helmets were later repainted in the field to reduce this glare. Note too the shiny lacquered finish of the national tricolour decal in this pre-war studio portrait. (Kohls Collection)**

many helmets were repainted by the men who wore them, using whatever was to hand.

The 1919 Treaty of Versailles required the confiscation and destruction of vast amounts of military equipment. Much that remained continued to bear World War I colour schemes. In 1922 the German government allocated funds to upgrade the military, which included new paint standards and colour schemes for basic equipment, vehicles, and artillery pieces. Many items – including helmets – were repainted a standard shade of light field-grey. Beginning in that year, Reichswehr officers began to file reports complaining about the painted surface of the helmet; they particularly noted that the smooth finish often gave off revealing reflections when wet, or if exposed to bright sunlight or

moonlight. The Reichswehr Minister authorized an investigation into the problem, and three paint-manufacturing companies were selected to compete for a new contract. After field trials finished in October 1930, the firm of Blume in Magdeburg was selected as the new supplier of a matt finish helmet paint.

Paint was also provided to military supply depots through requisitions placed by the central Procurement Office of the Wehrmacht. This paint was intended for touching-up and repainting of World War I helmets still in service; and in 1934–35 many of these transitional helmets received a second coat over their original Reichswehr finish. During these early years helmets were often repainted by hand using a paintbrush.

Following the introduction of the M1935 helmet, the firm of Duco AG in Berlin-Spindlersfeld was chosen as the primary supplier of paint. Their product had a smooth lacquer base with a heavy concentration of zinc to prevent rust; and although a matt finish continued to be thought important, factory-finished helmets often displayed a semi-gloss or 'eggshell' appearance. The Duco AG paint was produced in a light field-grey (*Feldgrau*) for the Army and Navy, and in a blue-grey (*Blaugrau*) for the Luftwaffe. Inevitably, colours often varied slightly from one production run to another. In addition, other firms were contracted to supply paint to the helmet factories when helmet production was expanded, resulting in yet more varied nuances of shade.

Colour standardization

The Supreme Commander of the Army established the standard colour for all helmets used by the Army and Navy in June 1935. This early paint scheme is often referred to as 'apple green' due to its unique shade of field-grey. The Navy often repainted helmets at unit level with light or dark grey colours if shipboard service was expected, but otherwise they continued to use the Army field-grey colour as their primary paint scheme.

This M1935 helmet exhibits field repainting. Large blocks of textured paint have chipped away, revealing the smooth pre-war finish underneath. This type of appearance was common to helmets that saw extended use in the field.

On 4 November 1935 – nearly six months after the introduction of a standard field-grey by the Army and Navy – the Luftwaffe selected blue-grey as their standard helmet colour. A darker shade of blue-grey was also applied to some helmets; there has been speculation that the darker helmets were intended for wear by anti-aircraft and ground combat units, though it is possible that variations were due simply to different sub-contracted paint suppliers.

To create a uniform standard for the manufacture of paint, the firm of Duco AG and others registered their colours with the German government. These industrial colour standards were administered by the RAL Institute (*Reichs Ausschuß für Lieferbedingungen und Gütesicherung*), established in 1927 through a government commission that set out to ensure that standard colours would be used on various industrial products. This included items manufactured for the military as well as other government organizations, such as the railway and postal services. The paint standards were not very rigorously enforced, and individual manufacturers could adopt a registered colour or create their own without difficulty. By the end of 1927 approximately 40 military colours had been registered with the RAL, including many used by the Reichswehr.

By May 1945 more than 120 individual registrations had been created to cover the entire scope of military paints used by the Wehrmacht. Due to the number of possible paint schemes as well as the variety of manufacturers supplying equipment, it is difficult to establish which registered colours were specifically designated for helmets. Table 7 provides a selection of 'RAL' numbers registered for use in the production of military equipment prior to May 1945; these are a representative sample of some of the colours most likely used in the production of helmet paints.

Table 7: RAL colour designations

Code	*Colour*	*Common use*
RAL 6006	Dark grey-olive	Army & Navy helmets
RAL 7008	Medium grey-green	Army & Navy helmets
RAL 7009	Light grey-green	Army & Navy helmets
RAL 7016	Anthracite-grey	Luftwaffe helmets
RAL 7027	Dark grey	Field-repainted helmets
RAL 7028	Dark yellow	Camouflage
RAL 8000	Yellow-brown	Camouflage
RAL 8017	Red-brown	Camouflage
RAL 8020	Brown	Camouflage

(Source: Author's research)

This M1940 helmet displays a non-reflective textured finish common to helmets delivered after 21 March 1940. The decal insignia has chipped off as a result of the rough painted surface.

Paint modifications

Between 1935 and 1939 helmets supplied to the Wehrmacht were painted in a smooth finish both inside and out. Finish types ranged from semi-gloss to near matt depending on the paint lot and application method. Specific orders were drafted by the German Army and Luftwaffe to prohibit men from polishing or greasing the helmet for parade purposes. Despite this, period photos clearly show that some helmets used in ceremonies were often painted with a clear gloss varnish; however, these helmets may have been reserved for parade use only.

When World War II began with the invasion of Poland on 1 September 1939, the M1935 helmets were painted a smooth finish, and had double decals – on the right side the national colours of Germany, and on the left side the respective insignia denoting arm-of-service. Recently formed Luftwaffe paratroop units (which also incorporated Army parachute infantry on 1 January 1939) used a field-grey smooth finish like that of the Army on M1938 Fallschirmjäger helmets, which bore double decals as prescribed for the regular Luftwaffe M1935 helmet.

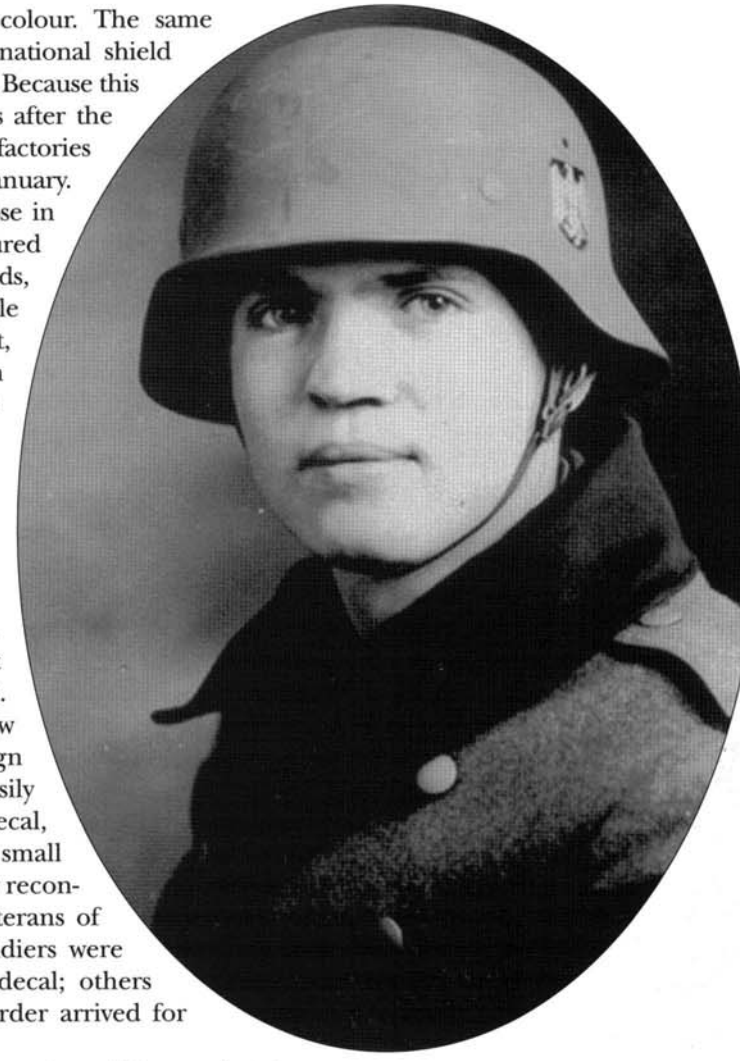
Two soldiers wear M1940 combat helmets with single decals. Characteristically, the paint has worn off one rivet (left) to reveal the bright metal surface underneath. Both men wear regimental-coloured identification loops on their shoulder straps. (Kohls Collection)

Following the end of the Polish campaign that October, the Wehrmacht began to evaluate a wide range of combat experiences, which led to several changes in helmet colouring and decals. The first took place on 27 January 1940, when the Army High Command ordered all helmets – both in service and in production – to be painted a smooth, matt grey colour. A few days later the Army High Command also requested that steel combat helmets be issued to all armoured vehicle crews. To comply with this order, many helmets were repainted matt grey over their previous field-grey colour.

A second change came on 21 March 1940, when the Army High Command ordered all helmets to be

painted a rough-textured, slate-grey colour. The same order called for the removal of the national shield decal from the right side of the helmet. Because this order was issued less than eight weeks after the previous one, it is unlikely that many factories were able to comply with that of 27 January. Many helmets in service as well as those in storage were factory-refinished in textured paint to comply with the new standards, and were then reissued with a single decal. The German Navy followed suit, and all helmets supplied directly from the factory were now configured with the new textured paint and a single decal. The non-reflective textured paint was applied on the exterior of the helmet only.

The order to remove the national tricolour shield and the change to textured paint was, obviously, an attempt to improve the concealment of infantry in combat situations. Reports from commanders who saw action during the Polish campaign stated that opposing forces could easily see the white part of the national decal, thus needlessly exposing troops to small arms fire and easing the task of enemy reconnaissance units in locating them. Veterans of these early campaigns recall that soldiers were ordered to scrape off the national decal; others were simply overpainted when the order arrived for repainting with a textured finish.



Obergrenadier (senior private) Suhl Eckhardt wears the M1940 helmet with single decal, factory-finished with matt field-grey paint.

It was not until the height of the invasion of France that the Luftwaffe adopted these regulations. On 12 June 1940, more than a month after the attack on France, the Luftwaffe abolished the national tricolour shield while adopting a rough-textured, blue-grey paint finish for the exterior of all helmets.

In addition to slate-grey, many Fallschirmjäger helmets received coats of field-grey textured paint identical to that used on Army helmets. This was a logical consequence of the increasing part that paratroop units played in prolonged ground combat, no different from the experience of regular infantry, during the middle and latter years of the war.

Under direct supervision, the central Procurement Office of the Wehrmacht was able to enforce paint standards on helmet manufacturers; but despite the changes ordered by Army High Command many helmets were left unchanged. Helmets in continuous use by the Wehrmacht often escaped repainting, and some helmets with pre-1940 configurations saw continuous use until May 1945. These included helmets placed in storage and later reissued, as well as those used in rear areas.

A petty officer (Bootsmannsmaat) of the Navy's coastal artillery wears the M1940 helmet with single gold-coloured decal. Naval helmets used by land-based units were factory-finished in the same field-grey paint used by the Army.

HELMET INSIGNIA

Beginning as early as 17 February 1934, the Chief of Army Administration issued orders for the creation and application of helmet insignia (*Stahlhelmabzeichen*) to denote the wearer's arm-of-service. The creation of these insignia coincided with the overall reorganization and expansion of the military following the electoral success of the National Socialists on 30 January 1933.

Prior to this date Reichsheer helmets had borne hand-painted crests in the colours of the province in which they were garrisoned. Instituted in approximately 1923, this shield-shaped insignia (*Wappenschild*) was painted on the left side of the World War I helmets used during this period (see page 3). From 26 January 1924 the Reichsmarine adopted a gold and white shield with anchor devices on the left side of the helmet.

These crests were discontinued by both the Reichsheer and Reichsmarine on 14 March 1933, and replaced with a new shield in the national colours (black, white and red) of the newly instituted Reich battle flag. The service emblem for the German Army and Navy instituted in April 1934 superseded all previous insignia, including those for the predecessor and constituent organizations of the Luftwaffe. The service emblem for the Luftwaffe began to appear on World War I model transitional helmets in approximately 1936.

Decal manufacture and application

Prior to 1934 Reichswehr helmet insignia were typically hand-painted. For the sake of uniformity, the clothing office within a unit often painted the insignia. Nevertheless, the application of emblems hand-painted by individuals naturally resulted in a wide range of variations dependent on artistic skill. Following the introduction of the new national shield in March 1933 there was a brief attempt at using a pressed metal shield on M1933 helmets, and in addition some decal transfers were printed in the three-colour design; but before April 1934 neither type of emblem was used extensively, and hand-painted shields were still the norm.

With the coming of the Third Reich, various firms with expertise in print media and lithography were contracted by the Reichs Ministry to produce helmet insignia in the form of high quality decal transfers (see Table 8A). Specifications called for printing in fade-resistant colours using flax oil varnish. Army decals utilized a layer of aluminium foil to create a metallic appearance like that found on uniform insignia. Decal dimensions were consistent from one firm to the next, with little variation in the final design (see Table 8B).

Decal transfers were printed in both lacquer-based and water-slide formats. Lacquer-based decals were printed face down on a thin layer of transfer paper with the metallic side exposed. Application required

painting the underside with a thin layer of Ducolux, Kopal, or Damar lacquer prior to placement on the helmet. Once the decal was bonded to the helmet a thin layer of varnish or lacquer was brushed onto the surface to increase durability – although in practice many decals never received this final protective coat.

Difficulties experienced with the lacquer-based transfers were no doubt the reason for a change to water-slide decals. These differed from lacquer-based transfers in being printed face up on a specially treated paper; between the decal and the transfer sheet was a thin layer of glue. The decals were dipped in water to soften the glue, then slid onto the surface of the helmet. Once the lacquer or glue had bonded, decals of both formats were permanent and often difficult to remove, even with hard pressure or by scraping. The fact that original specimens still retain their bright metallic appearance is testimony to their high standard of manufacture.

Table 8A: Decal manufacturers (partial listing)

Firm	*Location*
C.A.Pocher	Nürnberg
Ed.Strache	Warnsdorf/Vienna
Huber Jordon	Nürnberg
Methner u. Bürger	Berlin

Table 8B: Decal dimensions

Insignia	*Standard height x width*
Army eagle*	40/41mm x 33mm
Navy eagle*	40/41mm x 33mm
Air Force eagle (1st type)	36mm x 60mm
Air Force eagle (2nd type)	36mm x 67mm
Tricolour shield	40mm x 33mm

Note:
* 1mm height difference between some manufacturer variations

(Source: Author's research)

Placement of helmet insignia

The national tricolour shield introduced in March 1933 remained on the left side of the helmet until 17 February 1934. On this date it was moved to the right side of the helmet to accommodate the newly introduced service insignia of the Army and Navy on the left. Units participating in the newly instituted 'Hero's Memorial Day' and related parades held in Berlin were required to display the new insignia. Instructions required that decals be placed no less than 3.3cm below the ventilation lug of the helmet. It is important to note that up until this time all helmet insignia were applied at unit level; following the introduction of the M1935 helmet, factories began to apply decals as part of the finishing process, as the earlier model helmets were slowly phased out of service.

Army insignia

The first detailed description of Army insignia appeared in an order issued by the Reichswehr Minister on 5 April 1934. At this time the helmets in service included various World War I models; the M1935 was still in the prototype stage and had not yet been issued. The order requested that all military supply centres distribute the new Army insignia and coloured national shield decals. The tricolour shield introduced nearly 12 months earlier was to be removed in favour of the new decals. The cost for a single set of decals was estimated at 1.3 Reichpfennig. The national shield was moved to the right side of the helmet, and the Army's new eagle insignia replaced it on the left side. During this transition it was not uncommon for helmets to have misaligned or poorly placed insignia, since they were applied at unit level by individual soldiers or by the staff of Army clothing offices, who often failed to interpret the orders properly.

The service insignia of the Heer took the form of a silver-coloured eagle with down-folded wings, its talons clutching a swastika, on a black shield-shaped ground. Although intended primarily for the Army,

variations of this emblem could be found in a variety of symbolic uses throughout the Third Reich. Several makers were contracted to produce the decals, which accounts for slight variations in the design of the eagle. The Army service emblem was placed on helmets until discontinued on 28 August 1943.

The tricolour national decal was applied until 21 March 1940 (preceding the invasion of France on 10 May). The Army High Command directive of 21 March ordered that all such decals be removed from helmets, particular emphasis being placed on helmets designated for field or combat use. Despite the directive, many helmets in fact retained both insignia, particularly those used in rear areas and those in the possession of officers and high-ranking officials.

Navy insignia

All units under the direction of the Reichsmarine were required to comply with the orders issued by the Reichs Minister on 5 April 1934, predating the decree that changed the Reichsmarine into the Kriegsmarine in May 1935. For the Kriegsmarine this called for the removal of previous Reichswehr insignia and the application of a gold-coloured service insignia and tricolour national shield to all helmets. The Kriegsmarine used the same folded-wing eagle design as the Heer, and decals were manufactured to the same specifications as those used by the Army. The gold colour was chosen because it was the traditional 'lace and button' colour historically used by the Imperial German Navy, as silver had been by the Army. Helmet transfers were manufactured in both lacquer and water-slide formats.

As noted above, the number of helmets in active use by the Navy was considerably smaller than by the Army and Air Force, particularly in the early years preceding World War II. Following induction, naval personnel passed through basic military ceremonial and ground combat training similar to that of the Army. A small number of helmets were retained for this purpose and were stored at training and

(continued on page 41)

This M1940 single-decal Kriegsmarine helmet, showing virtually no service wear, was 'liberated' by a Canadian soldier serving with the Alberta-raised 18th Field Regiment RCA in March 1945. He found it lying discarded on the kitchen table of a small home in Holland.

1: Early grey-lined Army decal

4: Standard Navy decal

2: Standard Army decal

5: Naval decal variation

3: 'Large-footed' Army decal

6: Black-lined naval decal

1: Luftwaffe decal on camouflage-painted helmet

2: Luftwaffe decal and *Zimmerit* camouflage

3: Luftwaffe decal on M1938 paratroop helmet

4: Standard Luftwaffe decal

5: National colours decal

6: National colours decal on repainted helmet

1: Remanufactured M1918 'ear cut-out' helmet

2: M1940 Luftwaffe helmet

3: M1935 Kriegsmarine helmet

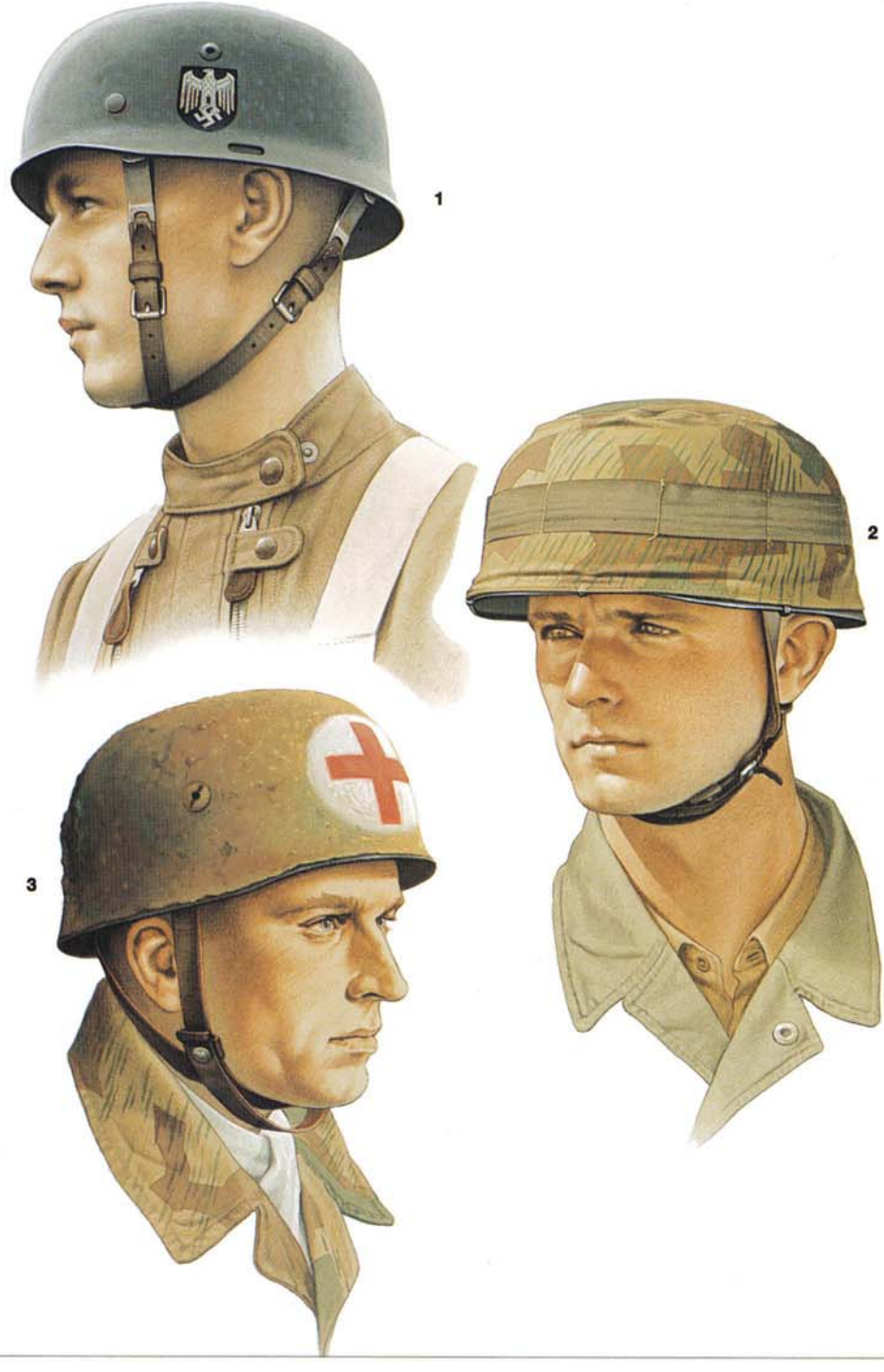
PARATROOP HELMETS

(Paintings by Kevin Lyles)

1: M1937 Army paratroop helmet

2: Second model paratroop helmet cover

3: M1938 medical orderly's helmet



CAMOUFLAGE TECHNIQUES

1: Mud camouflage

2: Sack cloth and wire mesh

3: Foliage and 'bread bag' strap

HELMETS DISPLAYING NATIONAL INSIGNIA

1: Luftwaffe, North African campaign

2: M1938 paratroop helmet

3: Luftwaffe, with Belorussian national colours

1: 'Normandy' pattern camouflage

2: Slate-grey finish

3: Two-colour camouflage

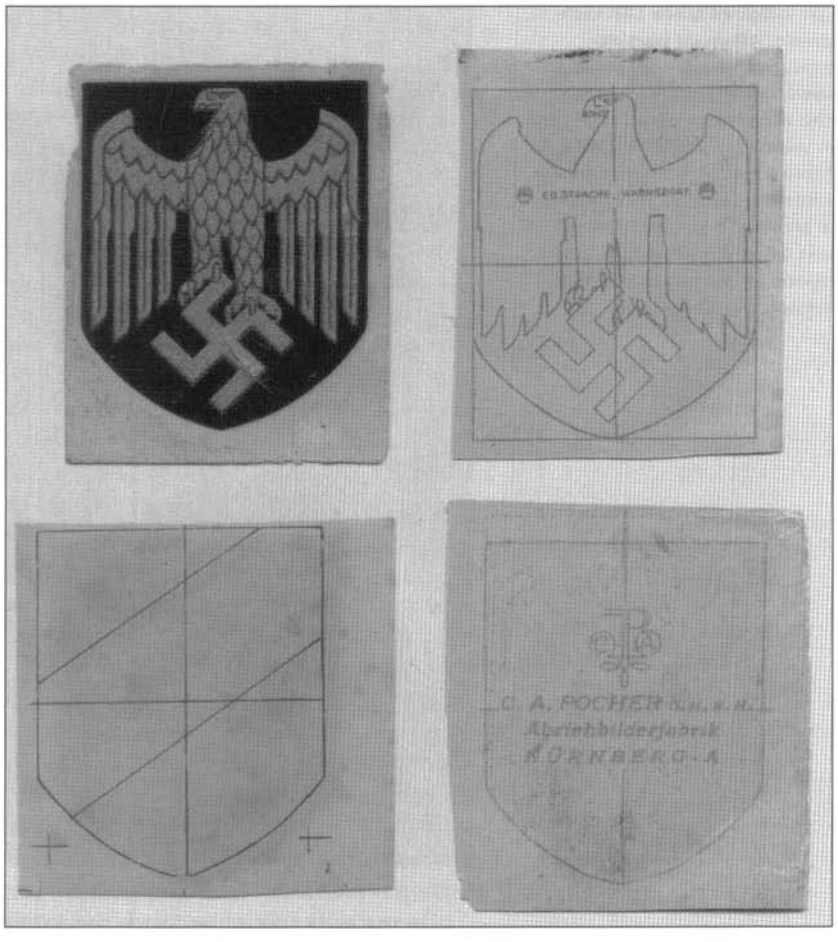
UNIQUE CAMOUFLAGE PATTERNS

1: *Zimmerit* and three-colour camouflage

2: Two-colour camouflage

3: Italian campaign camouflage

technical schools, and personnel used these on a temporary basis as they passed through this phase of their training. A larger number of helmets were issued to shore-based naval units including artillery, engineer, infantry, signals, and security troops; these units were employed in administration, supporting services, and in the defence of coastlines, shipyards and naval bases including coastal fortifications in occupied territories. Helmets were also issued to personnel designated as gunnery and anti-aircraft crews serving aboard a variety of surface warships. Although there are some photos showing deck gun crews wearing them, helmets were not issued extensively aboard U-boats, due to the severe limitations of space and their marginal usefulness on a submarine.

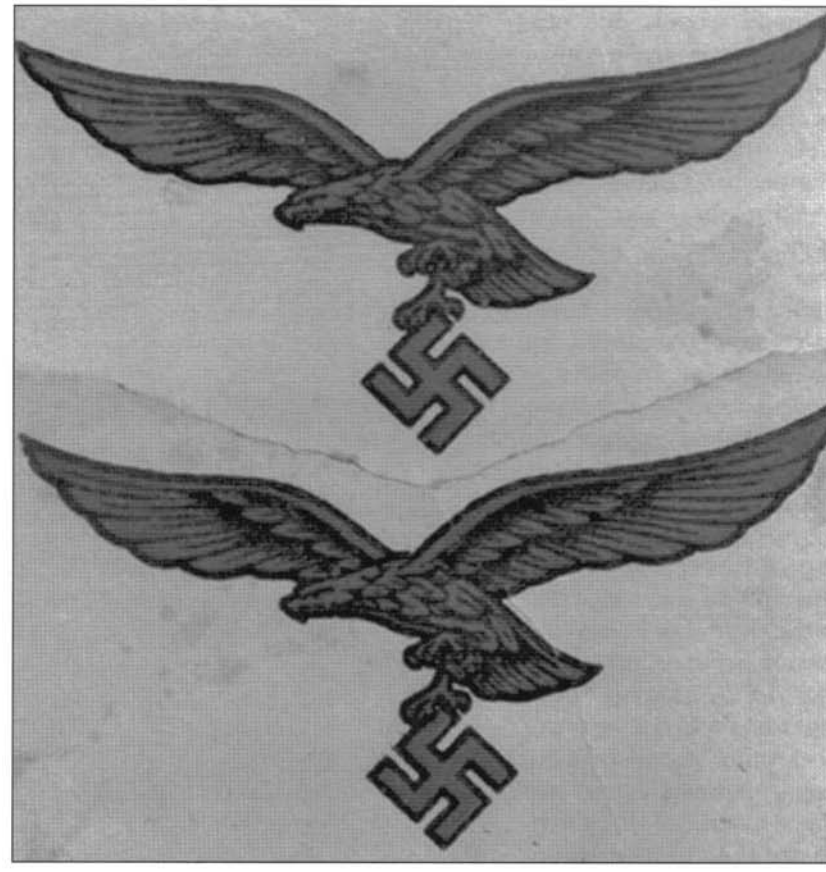


Helmet insignia were manufactured by a variety of printers in lacquered and water-slide formats. Several unapplied decals are shown here for comparison, including the cover sheets of two manufacturers, Ed.Strache and C.A.Pocher.

The Kriegsmarine retained the national decal on the right side of the helmet until 21 March 1940; following that date the M1940 and M1942 helmets were issued both with or without single decals. It appears that the Navy was successful in removing all World War I transitional helmets from active use when the M1935 came into service; unlike the Army, few photographs show older models in use after 1940.

Air Force insignia

Luftwaffe helmet insignia followed a pattern of constant change reflecting an era of rapid growth and expansion. The foundation of the German Air Force began in 1933 following the creation and integration of the Deutscher Luftschutz-Verband (DLV), the Prussian Politzieabteilung Wecke battalion, and the Fliegerjugend youth organization. Between mid-1934 and early 1935 these organizations were combined with the Reichsluftaufsicht, the SA-Standarte 'Feldherrnhalle' and the Landespolizei Regiment 'General Göring' (which grew out of Polizeiabteilung Wecke). The consolidated service was officially designated the Luftwaffe on 16 March 1935. Throughout its expansion the Luftwaffe would embrace a number of other constituent groups and distinct branches; the largest of these included the Nationalsozialistiches Flieger Korps (NSFK), Reichsluftschutzebund (RLB), Hitlerjugend Luftsportscharen, Hitlerjugend Flakhelfer,



Two subdued green Luftwaffe decals. Although wartime-produced, these were seldom used on Luftwaffe helmets. The examples shown are printed in water-transfer format. The Air Force's helmet national emblem was reversed from its direction in all other insignia, so that it was seen to 'fly forwards' when placed on the left side of the helmet. (Wu Collection)

Luftschutzwahrendienst, and the combat aircrew and troops of the Legion Condor, the Flakartillerie, the Fallschirmjäger and the Air Force Field Divisions.

The first use of unique helmet insignia denoting the Luftwaffe appeared two months after the official decree of its existence. The new Air Force was obliged to mirror orders issued by official state and military authorities, including those of February 1934 by the Chief of Army Administration governing the use of helmet insignia. On 16 May 1935 orders were introduced describing various regulation insignia for use on Luftwaffe uniform items, for implementation from 27 May. As in the older services, the national decal was to be placed on the right side of the helmet and a service emblem on the left. The Luftwaffe emblem differed radically from the others, however: it depicted a white-coloured eagle with spread wings, 'flying' from right to left and clutching a swastika, but without a shield-shaped backing.

At least three variations of the early eagle insignia were created during 1935, the differences between them being attributed to manufacturer's variations. Collectively, all three versions are often referred to as 'first pattern' decals, since a second decal of similar but distinct appearance was adopted by the Luftwaffe. While no reason for the change has ever been documented, period photographs indicate that this more aggressive looking 'second pattern' eagle – with an upswept rather than a 'drooping' tail – made its first appearance in 1937. It superseded the previous versions, although both types were

used on M1935 helmets; the newer style decal was applied to Luftwaffe helmets until discontinued at factory level on 28 August 1943.

A special gold-coloured version of the 'first pattern' decal was introduced on a limited basis for general officers, and for officials and technical personnel, in June 1935 (Luftwaffe Directive 422). Prior to 1940 this gold version was also used in the 'second pattern' style on Luftwaffe fire protection service helmets; one might conclude that Luftwaffe fire-fighting personnel were seen as technical troops, as noted in Luftwaffe Directive 422. The gold decal was most often found on M1935 and M1940 helmets used by senior staff officers.

One final variation of the 'second pattern' eagle also deserves mention. Although scarce, a subdued green version of the decal was produced for use on all combat helmets. The exact date of introduction is unknown; however, original specimens are sometimes encountered on decal sheets captured by Allied servicemen. Subdued decals of this kind were used on a limited basis, and are seldom seen in period photographs.

Special insignia: Hitlerjugend Flak Auxiliaries

Within the organizational jurisdiction of the Luftwaffe fell elements of the Hitler Youth (*Hitlerjugend*) whose primary role was to assist local anti-aircraft units (*Flakartillerie*) in home defence. Both young men and women were drawn into active service to assist the crews of the anti-aircraft weapons and supporting searchlight and detection equipment positioned around cities, towns, and airfields. The tasks performed by these volunteer 'Helpers' included bringing up ammunition, loading and unloading weapons, keeping watch against air raids, and in some cases actually assisting in the firing of weapons. Such activities required steel helmets for protection, which were supplied by the Flak units.

In order to distinguish Hitler Youth volunteers from Luftwaffe servicemen, a limited number of helmets were marked with an additional small HJ insignia – a red and white diamond with a central

This Luftwaffe M1940 helmet captured by a US serviceman in 1945 has the additional red, white and black diamond-shaped decal used by some Hitler Youth Anti-Aircraft Auxiliaries (*Flakhelfer*).

black swastika. When applied, the diamond was placed directly below the eagle decal on the left side of the helmet. No regulation governing the use of this decal has surfaced, and it seems to have been a matter of local choice among area authorities. Surviving examples typically display a diamond decal of somewhat newer appearance compared with the helmet's overall condition – a logical result of its application to helmets which had already seen use before their reissue to HJ-Helfer. Most surviving examples are M1940 and M1942 helmets, perhaps dating the decision to incorporate the additional decal after 1940.

Deutsches Afrikakorps

Aside from the insignia generally found on Wehrmacht helmets, no special service insignia was created for use on steel helmets worn by the Deutsches Afrikakorps (DAK) during the North African campaign. Helmets used in that theatre were initially issued in standard continental colour and decal configurations. When terrain dictated, men of all service branches were allowed to paint their helmets with tan paint in the colour shades found on vehicles, with an admixture of sand to produce a non-reflective surface. The sand and paint combination was generally hand-applied using a brush or rag, though if equipment was available some helmets were spray-painted in smooth desert tan finish. The quality of the paint finish and any camouflage scheme applied naturally varied greatly from one helmet to the next.

Helmets with decals were often hand-painted in such a way as to leave the service insignia visible; in other cases the decals were completely painted over. For men who possessed artistic talent, an unofficial practice was the application of a hand-painted palm tree and swastika emblem – resembling that officially applied to some DAK vehicles – on one or both sides of the helmet. Similarly, Luftwaffe ground crews occasionally hand-painted their squadron crest on one or both sides of the helmet after it had been painted desert tan. Despite these exceptions, photographic evidence suggests that such unofficial insignia were seldom seen in North Africa.

This single-decal M1940 Army helmet was captured in Tunisia in 1943. It exhibits a sprayed coat of tan paint which covers the eagle insignia. A small amount of coarse sand has been added to the paint to reduce reflection.

CAMOUFLAGE TECHNIQUES

Camouflage paint

The use of multi-coloured paint to camouflage helmets was fairly common in the Wehrmacht, while not as widespread as some might believe. Logically, the men with the best access to camouflage paint and spray-painting equipment served in units that had armour, troop carrying vehicles, artillery or anti-tank

weapons. In addition, photographs show that Fallschirmjäger units quite commonly camouflaged helmets on all fronts where they were deployed.

Although official instructions on camouflage-painting helmets had been issued in July 1918, during World War II no equivalent directives were circulated. The decision to camouflage helmets was left to the discretion of unit commanders, based on terrain, weather, and the tactical circumstances. Access to suitable paints in sufficient quantities was limited except for men who served in or alongside motorized units. Even if paint could be acquired, the prospect of having to reverse a camouflage paint scheme with the next change of season was presumably unappealing.

When applied, helmet camouflage paint showed colours and schemes adapted from regulations governing the concealment of

February 1943: Paratrooper Heinz Gonnermann served with 10.Kompanie of Fallschirmjäger Regiment (mot) 'Barenthin', a three-battalion unit commanded by Oberst Barenthin, which formed part of the ad hoc Division 'Von Manteufel' on the northern sector of the Tunisian front. Gonnermann is seen here wearing the M1935 helmet over-painted in 'yellow-brown'; he recalls that it was sprayed by the motor pool at Mateur using standard North African vehicle paint. Both decals were completely painted over. Gonnermann was trained as a motorcycle despatch rider (*Kradmelder*), but saw action in a heavy anti-tank platoon and as an infantryman. He was not issued the standard M1938 paratroop helmet – as was the case in many Fallschirmjäger units deployed as conventional light infantry, in order to avoid their identification by Allied intelligence. (Courtesy Heinz Gonnermann)

A photo taken at Orel, Russia, on 1 January 1943 illustrates the use of whitewash as snow camouflage. The decal on this M1940 helmet is faintly visible under the white primer.

vehicles and equipment. Photographs confirm that the potential colour range and application methods varied greatly, with wide differences in shade, texture, pattern, and paint thickness even within units. It would be impossible to catalogue the infinite variety of colour combinations and patterns that were ultimately used.

In North Africa – and in Russia, where mud was commonly applied to cover dark grey vehicle paint – a colour known as 'yellow-brown' (RAL 8000) was used for camouflage. This secondary coat of paint was applied to helmets by brush, cloth, or with a mechanical spray gun. In some cases the paint was also extended to the inside rim of the helmet while leaving the interior dome the original colour. Between 1941 and 1943 the German Army employed a standard two-colour camouflage system that also incorporated 'grey-green' (RAL 7008). The darker colour was sometimes applied in a mottling effect on top of the 'yellow-brown'. The use of these two colours was mandated on 17 March 1941 (HM 1941, No.281) for all forces serving in North Africa. Beginning in June 1941 this also extended to men serving in Russia and Italy. Sand was often mixed into the paint to matt the texture further. Because of the harsh desert conditions it was not uncommon for paint finishes to deteriorate as a result of bright sunlight and sandstorms combining to peel, flake and crack the camouflage paint, and in many cases constant exposure to bright sunlight would completely bleach the paint to a near-white colour.

Individual attempts at camouflaging helmets often resulted in unconventional paint schemes. Here two Army soldiers sharing a foxhole somewhere in Russia wear helmets with large tan-coloured splotches; under magnification they can be seen to be paintwork rather than applied mud.

Straps of various kinds were used to attach foliage directly to the helmet; the men of this reconnaissance squad have tucked the long grass of the steppes under some kind of narrow improvised band. (Beltrone Collection)

On 25 March 1942 the Army High Command issued an order (HM 1942, No.315) that specified a new camouflage scheme for all units serving in North Africa. A darker shade designated 'brown' (RAL 8020) was intended to replace the 'yellow-brown' used previously. In place of 'grey-green' a standard equipment colour called 'dark grey' (RAL 7027) was used. The change in these paint formulas, and the random intermixing of these four shades alone, is sufficient explanation for the almost infinite range of apparent camouflage finishes. To these must also be added the expedient use of Italian Army stocks, and of captured British Army vehicle paints (for which there is documentary confirmation).

Beginning in mid-1943 the German High Command changed from a two-colour standard scheme for vehicles and heavy equipment to a three-colour pattern. This incorporated 'dark yellow' (most probably RAL 7028) with a Luftwaffe 'olive-green', and 'red-brown' (RAL 8017). The 'olive-green' was not the same as that used on aircraft, but rather paint intended for Luftwaffe buildings and equipment. An order dated 18 February 1943 (HM 1943, No.181) called for the use of these colours on all camouflaged equipment throughout the Wehrmacht. These three colours made up what is often referred to as 'Normandy-style' camouflage because of its extensive use during the summer of 1944; in fact, however, these camouflage paints were used in all theatres of combat.

The various paints used to camouflage equipment – including helmets – were derived from concentrated paste issued in 2kg and 20kg (4.4 and 44lb) cans. These pastes, introduced in 1943, were manufactured in such a way that they could be thinned with either water or petrol (gasoline), and applied either by brush or spray gun. When thinned with water the paste proved to be relatively unstable under harsh conditions; running or smearing of the paint before it had completely dried was common. As a result petrol became the preferred thinning agent, and in some cases even motor oil was used.

For troops assigned to units with vehicles, the most common method of application to helmets was by spray gun; many armoured units were equipped with compressors and spray-painting equipment. This was certainly the technique used in rear areas or supply depots. Service decals on the sides of the helmet were sometimes masked, but were often simply painted over; and some helmets had decals only partially obscured by a thin veil of paint. Many helmets show decals that have been carefully painted around; such hand-painted examples often have a thicker finish, because the paste did not have to be thinned so much as when applied by spray gun.

Little emphasis seems to have been placed on camouflaging helmets during the last desperate months of the war. However, camouflage painting is relatively noticeable among Luftwaffe units serving in a

An MG42 machine gunner in a Luftwaffe field division – note the special Air Force camouflaged field jacket – wears the standard string helmet net, as first introduced by the Wehrmacht in August 1942.

variety of ground combat and field support roles, including both Fallschirmjäger and Field Divisions. This was presumably a reaction to the unsuitability of the Air Force helmets' blue-grey factory finish for concealment in infantry combat.

The anti-magnetic Zimmerit plaster applied to this infantryman's helmet is clearly visible. (Beltrone Collection)

Snow camouflage

Following the invasion of Russia, the use of water-soluble white primer for snow camouflage was ordered on 18 November 1941 (HM 1941, No.1128). This economical and easily reversed camouflage was used extensively during snow months. German veterans of the Eastern Front have reported that lime (calcimine) was often used as a substitute for this whitewash during the winter of 1941/42. Both whitewash and lime could be removed easily by hard scrubbing with water when the snow melted. In some cases men chose to paint their helmets with a more durable form of white paint; when spring came, these helmets would be repainted field-grey. When none of these materials were available, many soldiers improvised by using shreds of white cloth to mask the helmet's dark silhouette. The white cloth was attached with various forms of strapping, as noted below.

OTHER CAMOUFLAGE METHODS

Variations in camouflage methods depended greatly on the availability of both issued items (cloth covers and netting) and locally improvised materials (foliage, mud, and wire). The season, terrain, combat theatre, and skill of the individual soldier significantly influenced the vast array of methods used to camouflage helmets. This was sometimes a personal choice for each soldier; but conversations with German veterans indicate that the decision to camouflage equipment – including helmets – was often determined by unit commanders at company (*Kompanie*), platoon (*Zug*) or squad/section (*Gruppe*) levels. Military formations with special roles, such as those involved in seeking out and destroying enemy armour (*Panzerjäger*), often camouflaged their helmets using similar schemes for all helmets. The same was true of men serving with Fallschirmjäger units.

Documentation confirms that helmets were never camouflaged at factory level prior to supply to the Wehrmacht; all helmet camouflages were created in the field, or in military supply depots before issue.

Leather and canvas strapping

During the invasion of Poland many of the pre-war methods for camouflaging helmets were used. This included the adaptation of the detachable canvas shoulder-slinging strap issued with each soldier's haversack or 'bread bag' (*Brotbeutel*). Since the bread bag was normally attached to the back of the waist belt, a practical use for the redundant sling was wrapping it around the helmet and attaching it by means of the spring clip at each end. Its crossed configuration could then be used to hold small leafy twigs or sheaves of grass for camouflage purposes. So

effective was this technique that many soldiers continued to employ it well into 1944. The practice ceased when these straps were no longer issued as part of the standard kit. Many photos also show various types of narrow leather strap fixed around the helmet.

A more simplified type of strapping was achieved by cutting up rubber bicycle tyre inner tubes to form bands that could be snapped around the mid-line of the helmet shell. Many soldiers created improvised strapping simply by tying cord or twine around the helmet in the same fashion as the bread bag strap. The string was secured by tying the ends around the liner band inside the helmet, or even with small metal hooks that fitted around the base of the shell.

Application of mud and foliage

Natural elements found in the local terrain served as the most basic expedient camouflage. Many period photos show men in combat apparently wearing tan-coloured helmets. German veterans state that tan paint was not normally found in sufficient quantities, and that mud was the easiest form of improvised camouflage when other materials were unavailable. On every front and throughout the war, the application of mud became the most common way of dulling the glare from the helmet's surface. In dry weather earth was simply mixed with water, and mud was applied to the helmet by hand; if it washed off in the rain or dried and powdered off, it was the work of moments to replace it.

Branches, stalks of grass, leaves and other foliage were applied to helmets when concealment was essential in overgrown or wooded terrain. Foliage was attached by weaving it into netting and strapping, or by inserting it into the loops found on standard issue cloth helmet covers (see below). Although seldom seen, experiments were made with simulated foliage made from painted burlap (hessian) scraps in 1944 prior to the Allied invasion of France; photographs of self-propelled artillery crews serving in Normandy illustrate this technique, combined with standard helmet netting.

Woven out of simple twine, the issue nets were attached to the helmet with wire hooks, as shown here. This factory-produced helmet net was found in the gas mask canister of an Unteroffizier Stoiber, of Wehrmacht Feldpost 679d at the time of his capture.

Netting

Front-line troops were supplied with helmet camouflage nets (*Stahlhelmtarnnetz*) by an order dated 10 August 1942 (HM 42, No.693). These nets were factory-produced in various weights of natural or brown-coloured string twine. They were rectangular in shape, with knots at each overlapping joint. The size of the mesh formed by the cross-hatching of the twine varied from one manufacturer to another. When issued, the netting included a drawstring with a round metal loop and four zinc hooks for attaching the net to the helmet rim. It was common for the metal components to be discarded or lost in combat, and additional twine or rubber strapping was used to hold down the netting. In some cases the net

was tied directly to the inside of the helmet through the liner band ring. If German nets were not available it was common for men to improvise, or to use captured nets from both American and British helmets.

Wire

As a substitute for woven helmet nets, soldiers often used baling wire, and hexagonal mesh 'chicken wire', as alternatives. Photographs taken during the 1940 invasion of France show various wire configurations bent over and around the helmet shell, and this expedient was soon seen on other fronts. The exact pattern for applying the wire varied according to the type of wire available and the talent of the soldier. The most common method was a simple cruciform made by bending two lengths of baling wire over the shell from rim to rim, sideways and fore-and-aft, sometimes with a third length horizontally around the mid-line.

Another popular version employed chicken wire mesh, hand-formed over the entire surface of the helmet, the sharp ends of the wire being cut and brought under the rim to secure it. A third variation used chicken wire mesh on the top part of the dome only; the 'half basket' of mesh was attached to a single length of baling wire bent around the mid-line of the helmet, and three or four hand-made wire hooks linked the horizontal wire to various points on the rim to hold it all in place.

An infantry officer confers with his men on the Eastern Front, winter 1943/44. He wears the standard factory-made 'splinter pattern' helmet cover with foliage loops; the man at far left wears the same cover reversed to its white side.

This Fallschirmjäger wears the second pattern camouflage helmet cover. The band of web material sewn around the midline formed loops for added foliage camouflage. This example has the early arrangement of metal hooks to secure the cover to the helmet rim; later production versions had a more economical drawstring.

Obviously, the use of improvised wire frames or netting was dependent both on a soldier's proximity to farmyards or fence lines, and on the suitability of the terrain. Wire covers were extensively used in Italy as well as in France and Holland in 1944, but seldom in North Africa, where only Tunisia offered patches of thick vegetation.

Zimmerit plaster

A unique form of camouflage was the application of anti-magnetic plaster (*Zimmerit*) to the helmet shell. This rough cement plaster was introduced in 1943 to provide a protective rippled texture to the flat surfaces of fighting vehicles, where magnetic or adhesive anti-tank charges were often attached by infantry tank-killer teams. It was commonly applied to vehicles in the factory before they were painted; from mid-1943 Zimmerit was applied to most armoured fighting vehicles, and supplies for 'touching up' were presumably held by rear echelon repair workshops behind the front lines. Its use on helmets was rare and little photographic evidence for the practice has surfaced. Unpainted Zimmerit had a light neutral grey colour like that of dried concrete; when applied, it was smeared over the surface of the helmet and left to dry before being painted using standard vehicle camouflage colours.

CLOTH HELMET COVERS

In 1942 a general issue helmet cover (*Stahlhelmüberzüge*) was factory-produced and introduced by the German Army. The concept for the helmet cover was derived from similar types of shaped hessian (burlap) covers developed during World War I, and more recently from the distinctive reversible camouflage-printed model produced for Waffen-SS troops shortly before World War II. Although not intended for every soldier, the Army's camouflage-printed helmet cover was provided to both officers and enlisted men in sufficient quantities for it to be seen in photographs taken on all fronts. Although issued predominantly to the Army, some cloth covers were provided to Kriegsmarine coastal artillery and naval infantry units. The issue of Waffen-SS pattern covers to the Luftwaffe's premier field formation, the Brigade 'Hermann Göring' (later enhanced to divisional and corps status), was ordered on 21 July 1942; the Air Force Field Divisions seem to have received some limited issue of Army covers in 1943–44.

The first model helmet cover was manufactured from herringbone twill (HBT) imprinted with an overlapping camouflage pattern known as 'Splinter-B' for its smaller geometric shapes. This was similar to the pattern used on larger items such as the shelter quarter

(*Zeltbahn*), designated 'Splinter-A'. The HBT material proved in adequate and was quickly replaced with a heavier cotton duck fabric as used for shelter quarters.

The first helmet covers had one side printed with camouflage while the inside was left white for the winter months. The entire cover consisted of five separate pieces sewn together to fit the shape of the helmet; a drawstring in a tunnel sewn on the inside edge of the cover allowed the material to be cinched tightly around the underside of the rim. Later production versions included seven individual cloth loops sewn to the camouflaged side of the cover, positioned to allow for completely covering the helmet with foliage or grass. The white side of the cover did not have foliage loops.

Minor variations on this pattern were manufactured in small quantities and issued as needed. These were produced from the same material typically used in the manufacture of other camouflage clothing. The first factory-produced variant consisted of a cover reversible from 'mouse-grey' to white material, the grey exterior having foliage loops. A second field-made variant displayed the later, softer camouflage pattern which began to appear in 1943, variously known to post-war collectors as 'tan and water' or 'marsh pattern'. Other examples include factory-produced covers without reversible white interiors, as well as plain white covers produced from heavy cotton or

11 April 1943: Two general officers inspect the field position of a 3.7cm Pak 35/36 crew in Tunisia. The whole crew are wearing makeshift helmet covers made from sacking cloth.

HBT material. Many helmet covers were field-made by unit tailors using 'Splinter-A' material cut from shelter quarters.

Comments gathered from German veterans suggest that factory-made Army covers were supplied only in limited numbers. When available, they were given to unit commanders and men who operated mortars, anti-tank weapons and machine guns, since on the Eastern Front such men often drew a disproportionate amount of enemy fire. If no unit tailor was available, soldiers would improvise by cutting a swatch of cloth from a discarded shelter quarter and attaching it by various strapping arrangements. Helmet covers made from Italian camouflage-printed material were also used by German troops serving both in Italy and in Russia.

A field-improvised type of cover was also produced from sacking material, in sections sewn together and attached to the helmet by several means including drawstrings around the base, metal hooks at the rim, and string netting or wire mesh worn over the burlap. This type of cover, usually drab light brown/grey in colour, was practical in dry terrain such as the Mediterranean and central and southern Russia in summertime. In North Africa a similar type of cover was field-made from desert tan cloth or canvas; these were sometimes pieced together using captured British cloth or Italian material.

Paratroopers digging in on the Russian Front, spring 1943. They still seem to wear plain olive-green jump smocks; but note (right) the top surface of the second pattern camouflaged helmet cover, with the crossed strips of cloth reinforcement standing out pale against the 'Splinter-B' material. (Private collection)

Fallschirmjäger helmet covers

The first model Fallschirmjäger cover was produced from a densely woven olive-green material. Issued in the autumn of 1940, these were intended to match the olive-green jump smock worn by all paratroopers. In order to fit over the M1938 paratrooper helmet, the covers were constructed in two distinct sections: four making up the sides, and an oval piece for the top of the crown, sewn together in a simple bowl shape. Sewn around the mid-section of the cover was a band of thin web material, divided by stitching into loops through which foliage could be attached; a cruciform of narrow web was also sewn across the top of the crown. The plain olive-green cover was attached to the rim of the helmet by means of four or six small metal hooks sewn around the base of the material.

A second type of Fallschirmjäger cover was produced using 'Splinter-B' material. It made its first appearance prior to the invasion of Crete, when the new splinter-pattern jump

Men serving as despatch riders were often issued flight goggles; when not in use these were simply strapped around the mid-section of the helmet. Note the field torch buttoned to the rubberized cloth coat with its wool-faced collar. (Beltrone Collection)

smock was introduced in 1941. This version was constructed using the same method as the plain olive-green cover. Some examples of the second pattern cover did not include the crossed webbing on the top. Later examples also incorporated a drawstring around the base replacing the metal hooks found on earlier manufacture examples, for reasons of economy (in addition, the hooks used on the earlier versions often broke under stress). Neither the olive-green nor the camouflaged helmet cover was reversible.

Factory-produced covers in the 'tan and water/marsh' pattern camouflage cloth were not made for general issue, but improvised field-made covers using this material are known. So are expedient covers fashioned from scraps of various fabrics, including Italian camouflage and sacking material.

CHRONOLOGY

The following timeline includes events marking the development of the World War II German helmet. Where possible, the actual dates of orders found in wartime documents and records are quoted. As explained in the body text, actual compliance with orders was usually tardy and incomplete.

1927 The M1927 liner system is introduced to replace the World War I liners still in use.

1931 The aluminium-band M1931 liner system enters production, to gradually replace older liners, though many transitional helmets continue to be fitted with M1927 liners.

1932 18 March: Army High Command initiates testing of Vulkanfiber M1933 helmet; 880 examples are distributed to various units for a one year field trial.

1933 30 January: Adolf Hitler is appointed Chancellor of Germany. Reichswehr provincial helmet insignia subsequently abolished.

14 March: Tricolour national shield introduced for left side of Army helmets – mostly hand-painted but some in early decal form, and for M1933 helmets in pressed metal.

15 March: Army concludes field trial of M1933 helmet.

4 May: Army High Command expands distribution and testing of M1933 helmet.

1934 17 February: Two insignia ordered for all helmets – eagle in specific arm-of-service format on left side, shield in stripes of national colours moved to right.

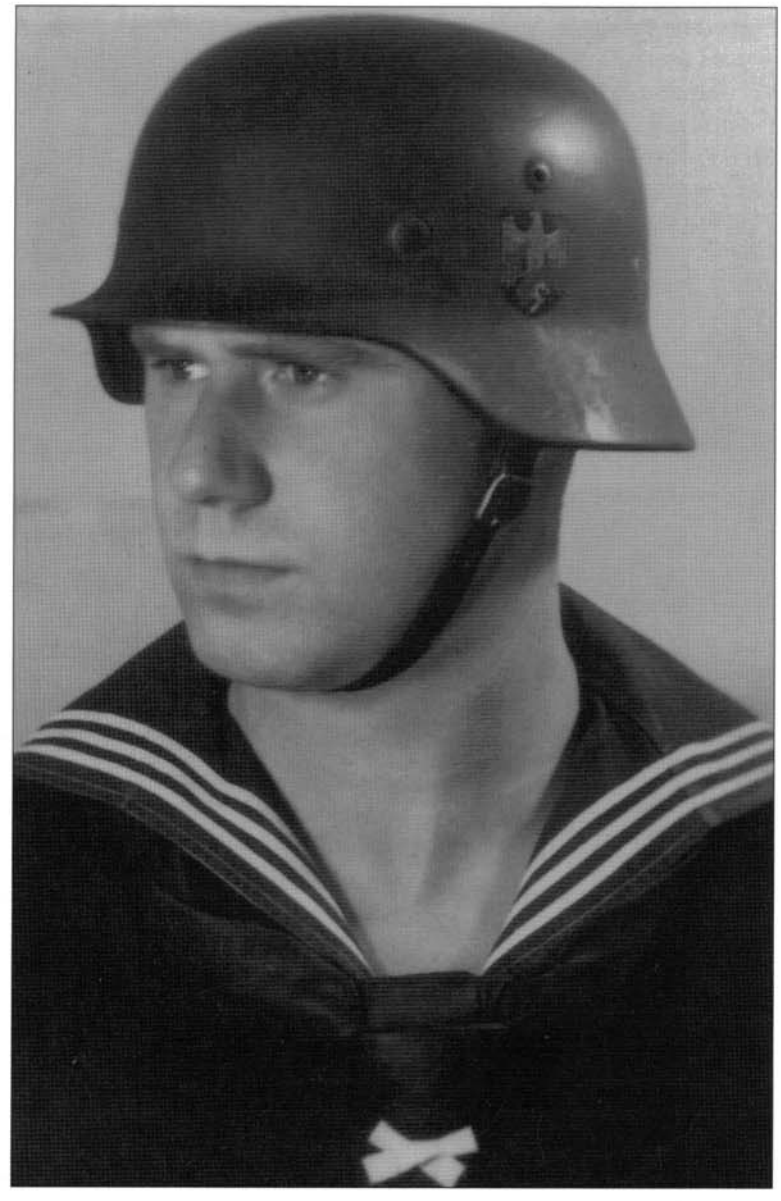
5 April: Standards for applying helmet insignia circulated by Army High Command.

30 July: Steel helmets restricted to military and police use.

1935 16 March: Proclamation transforming the Reichswehr into the Wehrmacht, including the newly revealed Luftwaffe.

16 May: The Luftwaffe introduces standards for insignia including 'first pattern' eagle decal for helmets.

25 June: Army High Command accepts the M1935 as replacement for all other helmets currently in use. Production begins at Thale



Naval enlisted man (Matrose) wearing the M1935 helmet with gold-coloured insignia. Although uncommon, some Kriegsmarine helmets were repainted battleship grey for use on shipboard.

factory, initially focused on Army and Luftwaffe requirements.
1 July: Army High Command orders all future helmet requisitions fulfilled with M1935.
September: Production of M1935 begins at Lauter factory.
4 November: Luftwaffe adopts standard blue-grey helmet colour.
1936 29 January: Luftwaffe forms first paratroop unit for training at Stendal. M1936 paratroop helmet introduced.
30 April: Army receives 100,000 of its initial order of M1935 helmets after nine-month delay partly due to large export order for China.
14 May: Luftwaffe complains of faulty liner retaining rivets; rivets redesigned, with gradual transition from brass to steel.
2 July: Luftwaffe recalls all pre-M1935 transitional helmets.
1937 28 February: 2,500 additional M1935 helmets delivered to Luftwaffe. Helmet shortfall in Wehrmacht still significant.
1 April: Army forms paratroop unit at Stendal. Preliminary tests of improved jump helmet conducted with view to replacing prototype M1937.
24 April: Army High Command estimates helmet shortfall at more than 2.2 million. Additional factories begin M1935 production.
May: Navy reports that it requires only 10,000 M1935 helmets to fill current needs.
1938 21 January: At a period of increased military ceremonial, Luftwaffe order forbids polishing of helmets for parade use.
8 February: Aluminium M1931 liner outer bands modified with reinforced side plates. Additional companies contracted to produce helmet liners.

Luftwaffe field units often camouflaged their helmets with colour schemes to match the terrain. Here an artillery observer serving on the Leningrad front in September 1943 wears a single-decal M1940 helmet that has been partially over-painted in light tan.

Three Luftwaffe NCOs gather for a casual portrait. The man in the centre wears an M1935 helmet with first pattern Luftwaffe decal, while the man at right wears the M1940 with second pattern decal. Note the more reflective paint surface of the left and centre helmets.

This Fallschirmjäger posing with his machine-pistol wears the M1938 paratroop helmet with single decal – the most common configuration.

13 March: Germany annexes Austria. World War I Austrian helmets repainted and receive Wehrmacht decals.

1 June: Army expands experimental paratroop unit to battalion strength. Both Luftwaffe and Army recruits issued with new M1938 paratroop helmet.

29 October: Patent is approved for replacing separate air vent bushings with embossed holes in M1935 helmet shell, but modification is not yet adopted.

1939 1 January: Army paratroop battalion integrated into Luftwaffe. M1938 helmets bearing both Army and Luftwaffe decals are worn during the transition.

1–3 September: German invasion of Poland leads to outbreak of World War II.

1940 27 January: Army orders all helmets to be repainted with smooth slate-grey finish.

2 February: Army tank crews issued steel helmets; order later extended to all armoured vehicle crews.

21 March: Army High Command orders removal of national tricolour shield decal from combat helmets. All helmets to be repainted with textured slate-grey paint. Factories phase out application of tricolour decal. Many helmets repainted in military supply depots; some undergo factory repainting.

26 March: Army approves embossed air vent modification to M1935 helmets; M1940 helmet subsequently introduced. M1931 aluminium liner bands begin phasing out, replaced with zinc-plated steel. Some World War I model helmets repainted and reissued according to new regulations.

9 April: Germany invades Denmark and Norway.

10–14 May: German invasion of Low Countries and France begins.

12 June: Luftwaffe orders removal of national tricolour decal from combat helmets. Textured blue-grey paint henceforward used on all Luftwaffe helmets; many M1935 helmets repainted, M1938 paratroop helmets produced using textured paint and single decal.

1941 14 February: First troops of what will become the Afrikakorps arrive in Libya.

This studio portrait of a Fallschirmjäger illustrates the use of washable primer as a form of winter camouflage. Air Force paratroop units generally followed the same camouflage protocols as introduced by the Army.

17 March: Army introduces camouflage scheme of 'yellow-brown' and 'grey-green' paint for vehicles and heavy equipment in North Africa.
6 April: Germany invades the Balkan states.
22 May: German airborne forces land on Crete; some M1938 helmets camouflaged with tan paint.
22 June: Germany invades Soviet Union.
18 November: 'Whitewash' officially introduced for winter camouflage on Eastern Front.
1942 25 March: Army introduces 'brown' and 'dark grey' camouflage scheme for vehicles and heavy equipment.
6 July: Army High Command orders simplification of M1940 manufacturing process by elimination of the helmet's rolled edge.
21 July: Luftwaffe supplies Brigade 'Hermann Göring' with Waffen-SS pattern camouflage helmet covers.
1 August: Factories begin mass production of M1942 helmet with flared rim. Existing stocks of M1940 continue to be assembled until depleted.
10 August: String helmet netting introduced for use by all Wehrmacht combat units.
1943 18 February: Army introduces three-colour camouflage system for vehicles and heavy equipment, using 'dark yellow', 'olive-green' and 'red-brown'.
13 May: German and Italian surrender in Tunisia ends North African campaign.
28 August: Army orders removal of arm-of-service helmet decals. Factories discontinue application. Navy and Luftwaffe follow suit.
8 November: Army discontinues issue of steel helmets to armoured vehicle crews.
1944 Lacking all factory-applied insignia, the M1942 is the only helmet in production for the Wehrmacht.
6 June: Allied forces land in Normandy.
1945 2 May: Fall of Berlin to Red Army; US, British and Soviet troops meet at Lübeck.
7 May: Unconditional surrender of all German forces, effective from midnight 8 May, brings World War II to an end in Europe.

FURTHER READING

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THE PLATES

A: ARMY AND NAVY HELMET INSIGNIA

A1: Early grey-lined Army decal

Insignia produced during the transition from the Reichswehr to the Wehrmacht were slightly different from those that came later. This Army decal appears on a World War I Austrian helmet converted to Wehrmacht use. The decal features a silver-coloured image with grey-lined interior details, on the standard black shield-shaped ground.

A2: Standard Army decal

A decal commonly used on Army helmets was that produced by the firm of Ed.Strache of Warnsdorf, established in 1872 as a newspaper and publishing company with operations primarily in Vienna. The firm produced water-slide and lacquer-based helmet decals. This example exhibits silver-grey highlights on a metallic silver-coloured image. The helmet is an M1935 that was field-repainted in 1940.

A3: 'Large-footed' Army decal

Several firms produced helmet insignia for the Wehrmacht, which resulted in a number of minor variations. Often described as the 'big-foot' decal by modern collectors, this example was produced by the firm of C.A.Pocher in Nürnberg.

A4: Standard Navy decal

Printed by the firm of Ed.Strache in Warnsdorf, this naval decal is identical to that used by the Army apart from the metallic gold-coloured image. This decal appears on an early M1935 double-decal helmet.

A5: Naval decal variation

This gold-coloured Kriegsmarine decal appears on an M1935 helmet that was field-repainted by hand with a thick battleship grey paint.

A6: Black-lined naval decal

This Kriegsmarine example differs from others in that the interior lines are solid black. The metallic backing layer is particularly evident in this image. The finely textured surface of the paint protrudes through the decal.

B: AIR FORCE AND NATIONAL INSIGNIA

B1: Second pattern Luftwaffe decal on camouflage-painted helmet

This second pattern Luftwaffe decal appears on an M1940 helmet camouflage-painted in three colours. The camouflage paint was applied to leave a triangular patch of blue-grey factory paint exposed around the decal – a common technique for saving time and difficulty.

B2: Luftwaffe decal on helmet camouflaged with Zimmerit

When Zimmerit was applied to a helmet it was generally done using a rag or an old paintbrush. A thick coat has been carefully applied right up to the edges of this age-worn second pattern Luftwaffe insignia, giving it a countersunk appearance.

B3: Second pattern Luftwaffe decal on M1938 paratroop helmet

This early example of the M1938 paratroop helmet displays the smooth field-grey paint finish typically found on such pieces.

B4: Standard Luftwaffe decal

Introduced for general use in 1937, the standard decal applied to all Luftwaffe helmets measured 36mm x 67mm. It was printed in both water-slide and lacquer-applied varieties. This clean example appears on an M1935 double-decal helmet.

B5: National colours decal

The national colours insignia was introduced in March 1933. After Feburary 1934 the tricolour shield appeared on the right side of all combat helmets, until ordered removed from general use in 1940. Decals of this kind were printed in both water and lacquer formats. The thin dark shadow around the borders of the insignia indicate that a protective coat of lacquer has been applied at the factory before delivery.

B6: National colours decal on repainted helmet

This example appears on an M1935 double-decal Army helmet that was reconditioned in 1940. The dull paint has been hand-applied by brush and has slightly covered the edges of the decal, giving the bottom a more pointed appearance.

This camouflaged M1942 Luftwaffe helmet bears two decals, one of which is the Belorussian national colours (see Plate F3). A large number of foreign volunteers and former prisoners of various nationalities served with the Wehrmacht, and the appropriate helmet insignia were sometimes permitted.

A studio portrait (dedicated to a soldier's grandmother) shows a 'crinkle-finished' M1935 helmet. The photo is dated February 1945; as the war drew to a close many helmets were taken from storage and repainted for issue to troops who were mobilized for the final battles.

C: WEHRMACHT HELMETS

C1: Remanufactured Army M1918 'ear cut-out' helmet

The M1918 'ear cut-out' helmets put back into very limited production to fill a shortfall of helmets during the expansion of the Wehrmacht in the mid-1930s were modelled exactly on the World War I pattern. The size range was increased, however: the World War I helmet was only ever made in 64cm shell size, but the 1930s model was produced in the 66cm shell. This example exhibits a smooth, hand-painted medium green finish over a lighter green Reichswehr paint, and has the internal characteristics common to helmets converted for Wehrmacht use in early 1934.

C2: M1940 Luftwaffe helmet

This unissued M1940 helmet demonstrates the colour and textured paint finish common to Luftwaffe helmets beginning in 1940. The single second pattern eagle decal was applied to this helmet without protective lacquer; consequently it still retains its overall white appearance.

C3: M1935 Kriegsmarine helmet

Like their Army counterparts, naval helmets were produced in various shades of light to medium field-grey. Early examples such as this were finished in smooth paint with double decals. The variant chinstrap is manufactured from utility straps used on tropical combat equipment. Kriegsmarine helmets are often encountered with variant or field-modified chinstraps.

D: PARATROOP HELMETS

(Paintings by Kevin Lyles)

D1: M1937 Army paratroop helmet

This volunteer in the Army's experimental Fallschirm Infanterie Kompanie wears the M1937 paratroop helmet developed by the firm of Eisenhüttenwerke at Thale. The second helmet to be produced, this model featured chinstraps with four sets of metal clips that secured to the helmet's liner band ring. The oblong slots in the sides of the helmet were used to attach the chinstrap when the helmet was not being worn during a parachute jump. Members of the Fallschirm Infanterie Kompanie were issued M1937 helmets bearing Army insignia. These helmets were subsequently recalled from service and replaced with the more widely known M1938. Not a single M1937 with Army insignia is known to have survived World War II.

D2: Second model paratroop helmet cover

This Luftwaffe paratrooper wears the second model, camouflage-printed helmet cover; like the first type in plain green, it attached to the sides of the helmet by means of small metal hooks. The splinter pattern camouflage cloth was printed in brown and green. The cloth band sewn around the midline provided loops for the insertion of foliage camouflage. Most examples were factory-produced, although many were made up in the field by unit tailors. Original examples are very scarce today.

D3: M1938 medical orderly's helmet

This Luftwaffe medical orderly wears the M1938 paratroop helmet thickly camouflage-painted and marked for use during the invasion of Crete in May 1941. The coarse mixture of sand and paint was a frequent addition to paratroop helmets worn in all theatres of operations. After the very heavy losses suffered on Crete, a wider variety of camouflage techniques and equipment were developed for German paratroopers. Markings such as these were later dropped to avoid drawing the undue attention of the enemy.

E: CAMOUFLAGE TECHNIQUES

(Paintings by Kevin Lyles)

E1: Mud camouflage

Veterans of the elite 'Großdeutschland' Division recall that mud was the basic form of camouflage used in Russia. Applied by hand, the soil clung to helmets as if it were paint. Contrary to common belief, many who served with this unit state that camouflage clothing was rarely issued, and the soldiers looked to the natural elements of their surroundings for expedient forms of camouflage. This infantryman wears the M1935 helmet with single decal, to which a thin layer of mud has been applied, giving it a mottled appearance.

E2: Sack cloth and wire mesh

The use of burlap/hessian sacking with chicken wire mesh stretched over the top, while generally uncommon, was a combination noted during the Normandy fighting in June–August 1944. Sack cloth by itself had, of course, been very widely used to produce concealing covers since World War I, when the M1916 and M1918 helmets had been provided with neat factory-made versions, in addition to those field-made in the trenches.

E3: Foliage and bread bag strap

Foliage was attached to the helmet by various means including bands cut from bicycle inner tubes, and individual arrangements of string and baling wire. The cloth sling issued to each soldier with his 'bread bag' haversack was often used for this purpose, as by this NCO.

F: HELMETS DISPLAYING NATIONAL INSIGNIA

F1: Luftwaffe helmet, North African campaign

The exterior of this M1935 double-decal helmet has been hand-painted tan for use in the African campaign – the shade is presumably that termed 'yellow-brown' in the RAL listings. On the interior dome is an ink mark that identifies the helmet as having once originated from the Aviation Command Headquarters at Geslingen. The name 'Ludwig Schulte' has at some time been delicately applied in red paint on the inside skirt of the helmet.

F2: M1938 paratroop helmet

Early paratroop helmets were painted in this smooth field-grey finish and bore both decals. The liner of this example is a mid-war pattern employing the late-style slotted aluminium retaining bolts. The dome stamp inside is dated 1939. Many early Luftwaffe paratroop helmets were kept in storage and later issued after retro-fitting with such mid-war features. This helmet was captured by US Army serviceman Fred J. Gugliuzza of New York, USA.

F3: M1942 helmet with Belorussian national colours

The Luftwaffe airfield at Frankfurt-am-Oder was the operations base for Belorussian volunteers serving in Flakartillerie, security and supply roles. Approximately 5,000 men were trained in anti-aircraft artillery duties and were later deployed in the defence of Berlin. These men wore standard single-decal Luftwaffe helmets modified by the addition of the Belorussian national colours. This helmet bears hand-painted spots of camouflage over the standard Luftwaffe blue-grey factory finish.

G: ARMY CAMOUFLAGE PAINT

G1: 'Normandy' pattern camouflage

Infantry helmets worn after the D-Day invasion were often camouflaged in order to blend with the French terrain. This M1940 single-decal Army helmet bears a hand-applied finish typical of what is commonly (though erroneously) called by collectors the 'Normandy pattern'. The paints are the type applied using canisters of paste that could be mixed to a wide variety of shades using either water or petrol (gasoline) as a thinning agent.

G2: Slate-grey finish

This M1935 double-decal Army helmet exhibits a hand-applied coat of matt slate-grey paint over the smooth field-grey factory finish. It has been refinished both inside and out, leaving both decals exposed. Although a single colour, this paint finish is properly termed 'camouflage', since the Army established this new paint scheme for field combat helmets in 1940 in response to reports that the factory finish was too reflective.

G3: Two-colour camouflage

This M1940 helmet exhibits a spray-painted camouflage finish consisting of 'dark yellow' and green. Helmets bearing spray-painted finishes were less common than those done with a paint brush. This camouflage pattern was common during the fighting in France in the summer of 1944. The helmet was acquired from the estate of a Pennsylvania, USA, veteran.

Major von Salviati, a battalion commander with Infanterie Regiment 90, 20.Infanterie Division, is shown here with his helmet heavily smeared with mud. A veteran of World War I, Maj von Salviati was killed in action in 1945. (Jervås Collection)

H: UNIQUE CAMOUFLAGE PATTERNS

H1: *Zimmerit* and three-colour camouflage

This M1940 Army helmet bears an even coat of Zimmerit plaster which appears to have been thinned to the point where it could be applied with a spray gun. A three-colour camouflage pattern of dark yellow, dark green and red-brown has been spray-painted on top of the Zimmerit. The interior of the helmet retains its factory-applied field-grey paint. Discovered in the Netherlands in 1998, this helmet was found inside the rafters of an abandoned barn along the retreat routes of the German Army during the autumn of 1944.

H2: Two-colour camouflage

This M1940 Luftwaffe helmet exhibits a hand-brushed camouflage finish of red-brown and dark yellow over the factory blue-grey paint. Many units in the field did not have access to materials that could easily be used for masking decals; many Luftwaffe helmets were over-painted in such a way that the complex shape of the decal was left exposed with a wide triangular border.

H3: Italian campaign camouflage

This M1935 helmet has both red-brown and green paint applied in broad brush strokes over the hand-applied dark yellow finish, and has an attached 'half basket' of chicken wire mesh anchored with a length of baling wire and wire hooks. Wire-covered helmets were most usually seen in Italy and NW Europe, where such materials were commonly available in the field. The name 'Wilting' appears in thick white letters under the rear skirt of this helmet, which was acquired in 1989 from the estate of a US veteran who served in Italy.

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